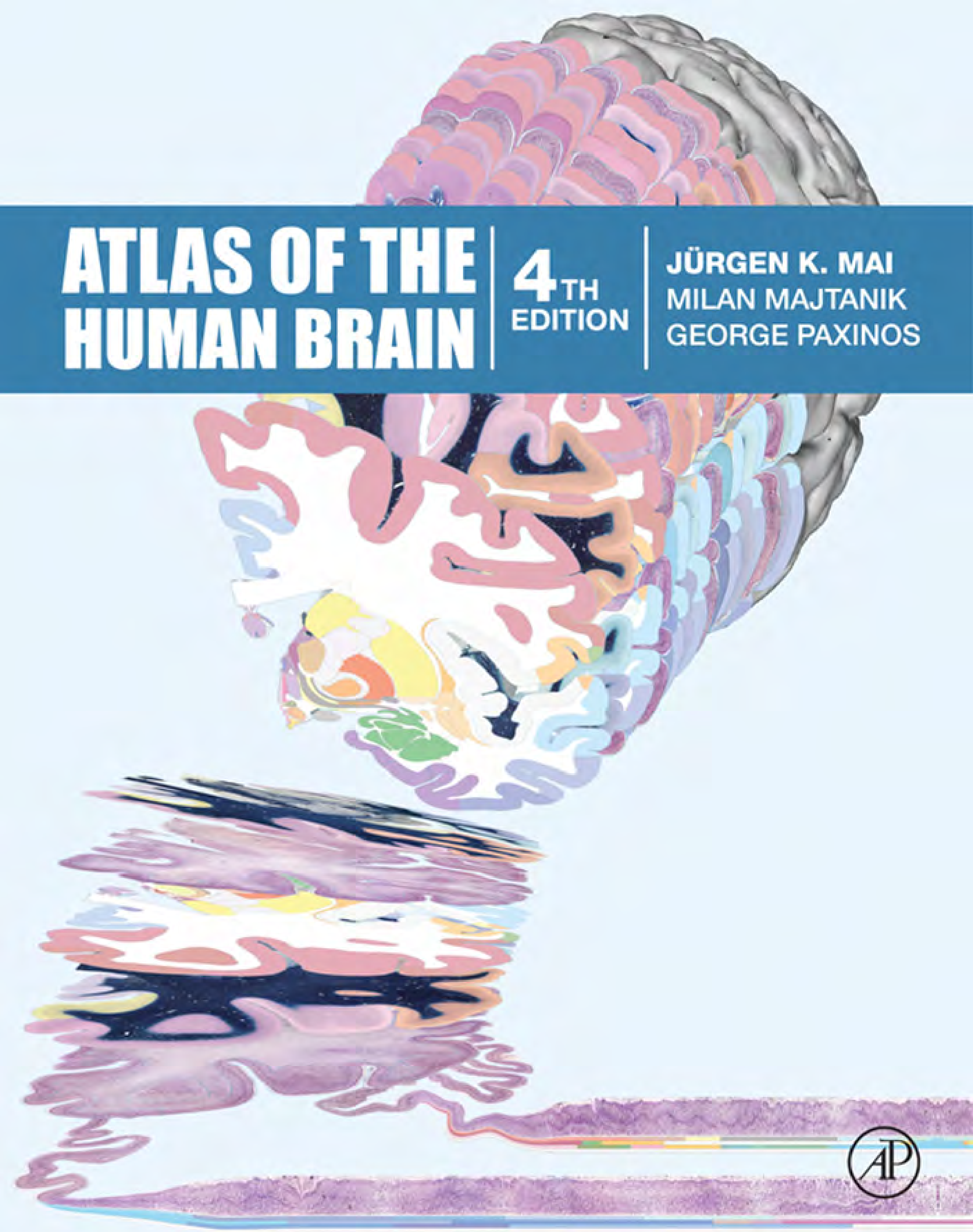
ATLAS OF THE HUMAN BRAIN

4TH EDITION

JÜRGEN K. MAI
MILAN MAJTANIK
GEORGE PAXINOS



Atlas of the Human Brain

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Atlas of the Human Brain

4th edition

Jürgen K. Mai
Institute of Anatomy I, Heinrich-Heine-University, Düsseldorf, Germany

Milan Majtanik
MR-X-Brain GmbH, Düsseldorf, Germany

George Paxinos
Neuroscience Research Australia and The University of New South Wales, Sydney, Australia

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Fourth edition

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Preface

The publication of the 4th Edition of Atlas of the Human Brain affords us the opportunity to include features which can be of assistance to the new fields of neuroscience – functional imaging, resting state imaging and tractography.

Totally new in this edition is the inclusion of Nissl plates with delineation of cortical areas (Brodmann's areas), the first time that these areas have been presented in serial histological sections.

This book consists of two major parts. They feature different aspects of brain morphology and topography.

Part 1: Three Atlases of the Brain in the Head

They display the brain in the head sectioned in the three cardinal planes. It consists of serial 1-cm thick sections from three human heads that were previously scanned with MRI. Each head was sectioned either in the horizontal (axial), coronal, or sagittal plane. The sectioning of the brain in the skull ensures that no significant deformation of the brain occurred and allows correlation of bony landmarks, nerves, and blood vessels. In addition, included are X-ray images of the cadaver sections and MR-images from a healthy volunteer showing levels corresponding to those depicted in the *Atlas* plates.

Part 2: Atlas of the Human Brain in Stereotaxic (MNI) Space (AHB)

The AHB consists of a detailed myelo- and cytoarchitectonic atlas of the isolated brain in MNI space. It is represented by serial histological sections of one hemisphere with meticulous delineations. It displays 99 fiber-stained (myelin) sections accompanied by detailed diagrammatic delineations and 50 cell-stained (Nissl) sections of the right brain hemisphere.

This brain was selected because it was sectioned well and stained well by the great anatomists Oscar and Cécile Vogt and has been studied in the last 80 years by a number of scientists, including H. Brockhaus, R. Hassler, A. Hopf, W. Wahren and F. Sanides. Selected sections which can optionally shown by virtual microscopy as well as the published literature referring to this brain can be accessed at the free website: www.thehumanbrain.info.

The 4th edition of the *Atlas of the Brain in Stereotaxic (MNI) Space* contains:

- 99 photographs of sections stained for myelin juxtaposed by 99 detailed diagrams.
- 50 sections stained for cell bodies, interposed at half the frequency of the myelin series. The cell-stained sections are not diagrammed but are accompanied by high resolution photographs of cortical areas.
- The photographs and diagrams represent the complete hemisphere and are placed in the MNI stereotaxic space.
- In the cell-stained (Nissl) plates cortical delineations (Brodmann's areas) (derived from Brodmann maps) are provided.
- Parts of cortical areas are displayed at high magnification on the facing page of full page Nissl sections. We selected preferentially those areas which are thought to correspond with those published by von Economo and Koskinas (1925).
- A novel way of depicting cortical areal pattern is used: the cortical cytoarchitectonic ribbon is unfolded and presented linearly, in registration with the interpretation of earlier authors as we perceive their work.
- Low magnification diagrams in the horizontal (axial) and sagittal planes are included, calculated from the 3D model of the *Atlas* brain.

The magnification of the photographs is higher than the diagrams because in this way the photographs can be bled for the sake of greater resolution. Rostral to the genu of the corpus callosum and caudal to the splenium we used higher and varying magnification, dictated by the availability of space. Between the two anterior-posterior extremes of the corpus callosum we kept the magnification of the photographs constant.

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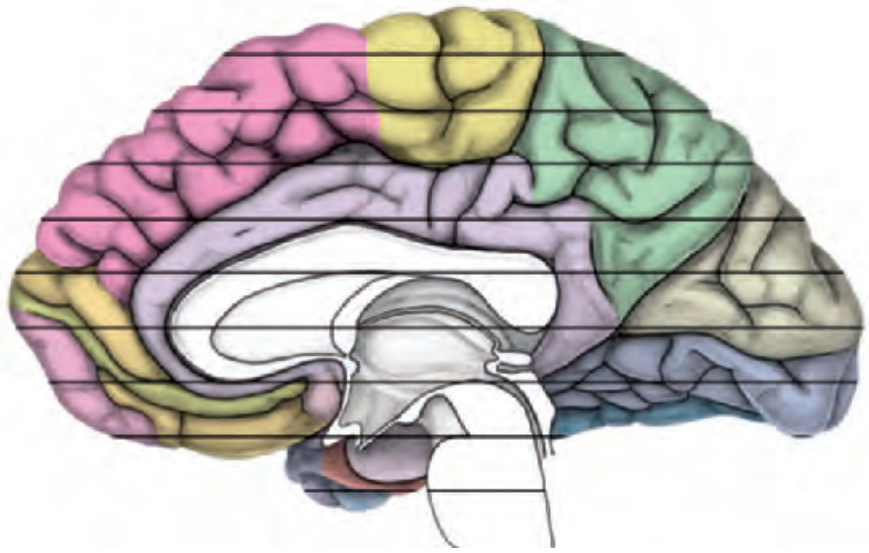
We acknowledge support for this project from the Society of Friends and Supporters of the Heinrich-Heine-University at Düsseldorf. George Paxinos was supported by an NHMRC fellowship. The sponsorship by the Jörg Bernards-Stiftung, Cologne, and the private entrepreneurship by Miroslaw Pienkowski, Trinon GmbH, Karlsruhe was essential because none of the applications for support from the German research agencies were successful. In this we are in good company in that Korbinian Brodmann who was also refused funding by German funding bodies that should have supported him. Finally, our thoughts go with gratitude to those, who provided their bodies for educational and research purposes in anatomy.

DEDICATION:

To Joseph Assheuer and Thomas Voß for their major contribution to the earlier editions of this work

Part 1: Three Atlases of the Brain in the Head

Horizontal Atlas:



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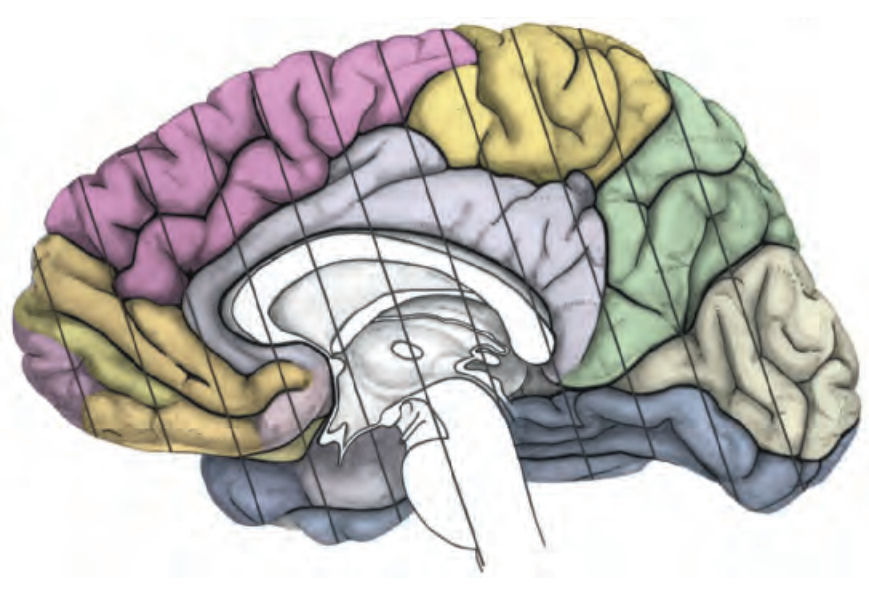

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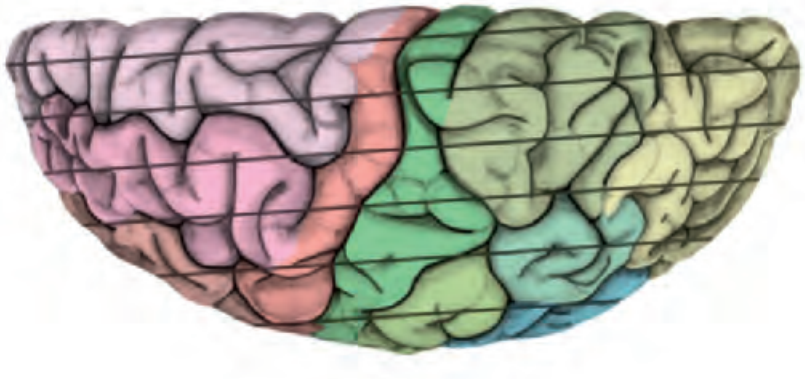

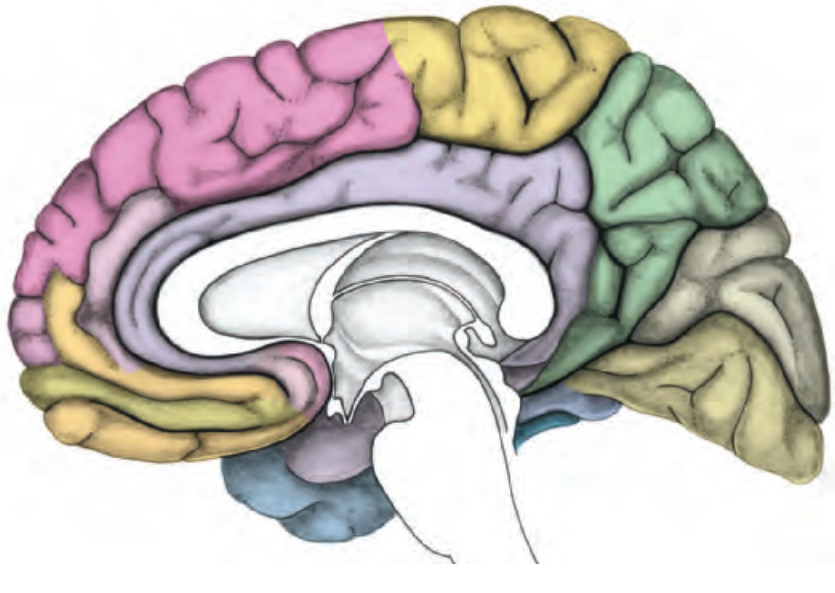

1.1 Materials and Methods

In our understanding it is important to see the brain embedded into its environment. This part displays the brain in the head sectioned in three different cut angles. It consists of serial 1-cm thick sections from three human heads that were previously scanned with MRI. Each head was sectioned either in the horizontal (axial), coronal, or sagittal plane. The sectioning of the brain in the skull ensures that no significant deformation of the brain occurred and allows correlation of bony landmarks, nerves, and blood vessels. In addition, included are X-ray images of the cadaver sections and MR-images from a healthy volunteer showing levels corresponding to those depicted in the atlas plates.

1.1.1 Anatomical Preparations

The three heads were obtained from bodies donated to the Department of Anatomy, Heinrich-Heine University of Düsseldorf. The studies were performed in accordance with established ethical standards. The cadavers were perfused via the radial veins first with physiological saline and then with fixative containing 10% formalin, glycerol, and Incidin (© Henkel, Düsseldorf). The heads were covered with linen and fixative to prevent drying out between MRI and freezing.

1.1.2 Magnetic Resonance Imaging (MRI)

MRI Scans: MRI scans were performed in the horizontal, coronal, sagittal, and oblique coronal planes according to a standardized protocol (Assheuer et al., 1990). The corresponding section planes were defined by the intercommissural line and verticals intersecting this line in the center of the anterior and posterior commissures, except for the oblique coronal plane which was chosen to be parallel to the long axis of the brainstem (Meynert's plane).

In vitro imaging: MRI scans of the anatomical preparations are presented ahead of the macroscopic atlases. Scans and measurements were performed on a 0.15 Tesla superconductive magnet (Vista 2035, Picker International) in 1985. We used a multislice double-echo sequence [spin-echo sequence (SE) 5000/40/160] with four excitations to render proton (N(H))- and T2-weighted images. These scans are presented in the pages preceding the figures of the horizontal, coronal, and sagittal sections within the three *Atlases*).

In *vivo/in vitro* correlation was performed to determine the effect of the absence of blood flow, cessation of metabolism, fixation procedures and temperature on relaxation times, signal-to-noise ratio, and contrast. To perform this comparative analysis between living and post-mortem tissue, the heads of two volunteers and of two cadaver heads were scanned with the 0.15 Tesla superconductive magnet (Vista 2035, Picker International) using single-slice technique with SE and inversion recovery (IR) sequences with the following parameters: SE (TR: 200, 800, 1600, 3200, 6400 ms combined with TE: 30, 40, 60, 80, 120, 160 ms) and IR (TR: 620, 1240, 2480 ms combined with TI: 32, 100, 150, 200, 300, 400, 500, 600, 700 ms). The slice thickness was 5 mm with a matrix of 256 x 256 and a field of view of 250 mm.

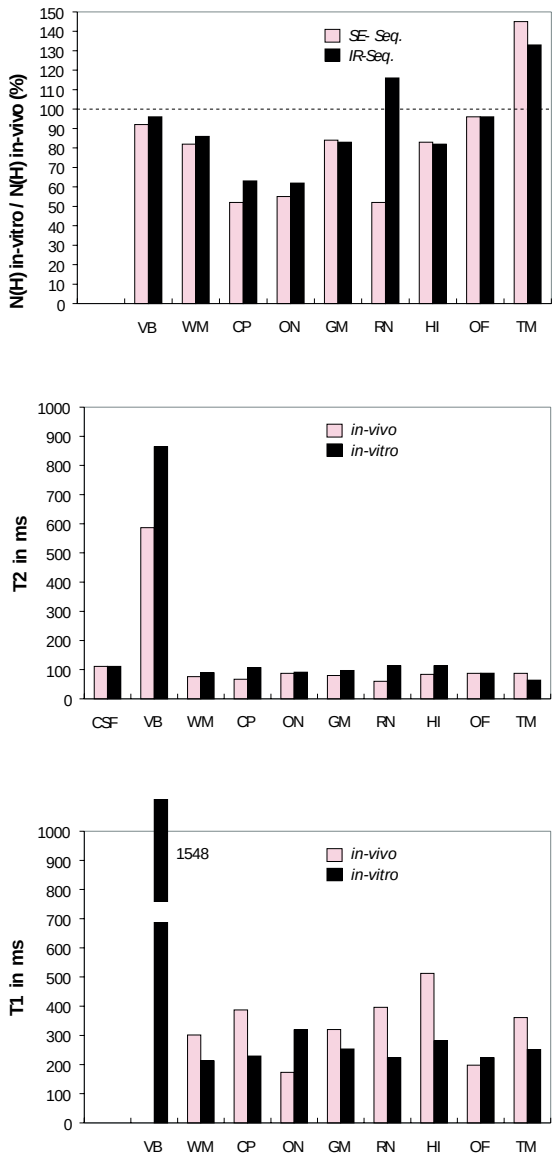

Figure 1.1 Comparison between living and post-mortem tissue. T1 (spin-lattice relaxation) times, T2 (spin-spin relaxation) times, and N(H) values were measured from the same areas under *in vitro* and *in vivo* conditions. The N(H) values were calculated from SE-sequences (red squares) and IR-sequences (black squares). They are presented as quotient of *in vitro* values to *in vivo* values in %. Abbreviations: CSF: cerebrospinal fluid; VB: vitreous body; OF: orbital fat; ON: optic nerve; HI: hippocampus; WM: white matter; GM: gray matter, CP: cerebral peduncle; RN: red nucleus; TM: temporalis muscle. (Data from Longerich, 1989).

T1 (spin-lattice relaxation) times, T2 (spin-spin relaxation) times, and N(H) (proton density) values of the *in vivo* and *in vitro* tissues are represented in Fig. 1.

Compared with the *in vivo* results, the *in vitro* tissues show large, nonlinear reduction in T1 relaxation times and N(H) values and small (negligible) changes in T2 relaxation times. A stable correlation exists between the *in vitro* and *in vivo* relaxation curves. For further details see Longerich (1989).

In vivo imaging: MRI scans of a healthy volunteer are presented at each atlas level. For *in vivo* imaging we used a 3 Tesla imager (Siemens Magnetom Trio) with the following protocols: TR 2500, TE 4.79 and TR 3000, TE 355. The slice thickness was 0.6 mm with a matrix of 320 x 320. These images are presented in Sections 1.2 to 1.4 facing each macroscopic anatomical section.

1.1.3 Preparation and Photography of the Anatomical Slices

Immediately after the MR scans, the heads were frozen in a -45°C freezer and later sliced at 1-cm thickness either in the horizontal, oblique coronal, and sagittal plane. The oblique coronal plane was angulated by –20°, such that the plane of the section is parallel to the brainstem axis and corresponds to the major ascending and descending fiber tracts.

The head slices were then photographed together with a scale bar. Each 1 cm slice was x-rayed separately. Its blood vessels were then filled with radio-opaque material and demonstrated by another x-ray. The course of the larger vessels within each slice was then drawn and combined with the x-ray. The resulting images are shown at the lowest panel in the left column next to the photos and diagrams of the slices (except for the horizontal plane).

Later, the brain slices were removed from the skull. The head and neck structures were dissected in order to demonstrate the topographic relations within the 1-cm slices. The 1-cm brain slices were mounted according to their *in vivo* situation to physically reconstruct the brain. After removal of the arachnoid mater photographs were made to document the gyrification pattern. These photographs form the basis of the diagrams preceding each of the three *Atlases of the Brain in the Head*, taking into account the 1-mm loss of tissue at every 1-cm level due to the sawing.

1.1.4 Preparation of 100 µm Thick Frozen Histological Brain Sections

After removal from the surrounding skull and photography of the assembled brain 1-cm slices, these were immersed for 48 hours in a fixative containing 4% formalin and 30% sucrose. Each slice was then positioned on a freezing stage (30 x 20 cm) of a microtome (Fig. 1.2a) and a mould was placed around it into which the mounting medium (methylcellulose dissolved in water and stained with various chromogens) was poured. After cooling down to -20°C, fiducial marks were made (Fig. 1.2b) and the blockface was photographed together with a scale bar prior to taking each section (Fig. 1.2c). Sections taken at 100-µm thickness were transferred to individual containers filled with phosphate-buffered saline (plus 30% sucrose). The photographs which were taken from the blockface aided correct mounting of the sections. All sections were mounted and then stained (with either toluidine blue or cresyl violet) for Nissl substance or (with hematoxylin or Sudan black B) for myelinated fibers. By means of the fiducial marks the single sections were compiled in a sequence from rostral to caudal. 3-D reconstructions were made from the blockface images obtained during the sectioning process using the AMIRA (© FEI Visualization Sciences Group) software system (Fig. 1.2d). In addition tracings of pial and ventricular surfaces as well as of the outlines of segmented internal structures were used for a vector model using a program developed by L. Teckhaus, MPI Dortmund.

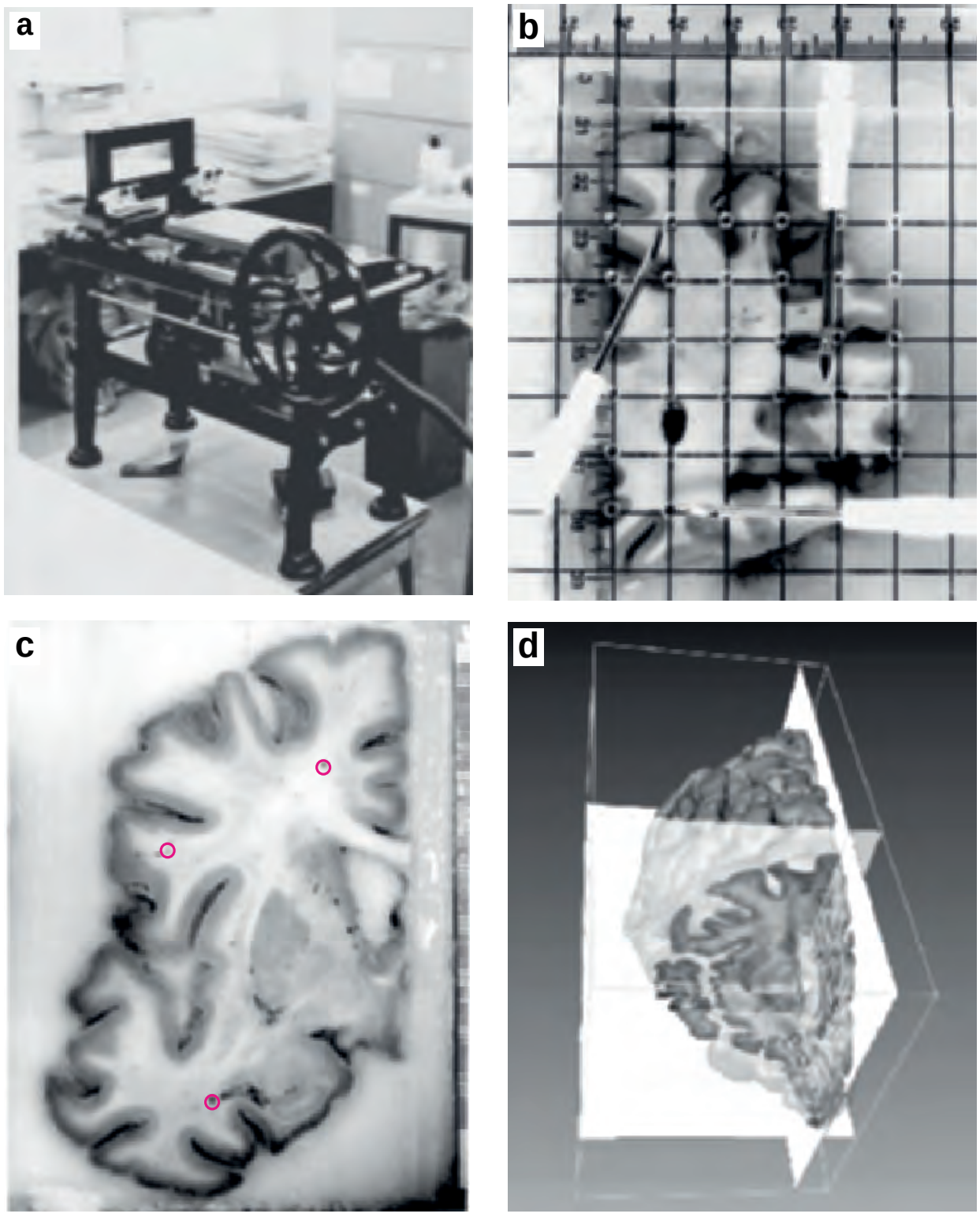

Figure 1.2. (a) Cryosectioning device consisting of the Tetrander (“Pantomikrotom“; see Vogt, 1905), a self-built freezing table, photograph stand (fixed to the vertical rectangle), and tube holder for dry ice. (b) Frozen tissue block overlaid with a 1 cm thick slab from plastic with drill holes providing a matrix of 1x1 cm distance and securing precise perpendicular orientation of cannulas used for punch marking. (c) Fixed slice of the hemisphere (represented in Section 2.2) embedded in methylcellulose and showing section surface with scales and punch marks (fiducial marks used later for topographic adjustment of sections). (d) Screenshot of the 3D reconstruction generated from the blockface images obtained during sectioning of the brain represented in Section 2.2).

1.1.5 Presentation of the Images for the Three Atlases of the Brain in the Head

We represent the head with the brain in three different cut angles: horizontal/axial, sagittal and coronal. The coronal section angle was not orthogonal to the others but tilted by -20° which results in a cut angle that is perpendicular to the brainstem (Meynert) axis. This displays the major ascending and descending long fiber tracts.

All representations of anatomical head and brain slices are mounted in the same way: Each *Atlas* begins with *in vitro* MR image series in all three cardinal planes of the unsectioned head on which it was based (Fig. 1.3).

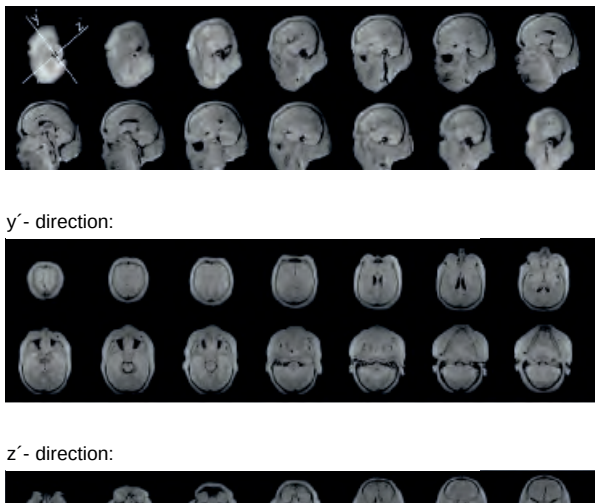

Figure 1.3. Each series of sections is headed by *in vitro* MR-images of the head which were taken prior to sectioning. To provide a comprehensive view of the head, MR-images are shown in all three orthogonal planes This allows a better orientation in the three-dimensional space and helps to recognize the topography of selected structures. The images appear in low quality because they were produced in the 1980-ties with one of the first commercial MR-systems.

The following two pages within each of the horizontal, oblique coronal and sagittal atlases present surface views of the brains showing their gross morphology together with the delineation of the main gyri and sulci (Fig. 1.4 and 1.5). The gyri are consistently color-coded through the three *Atlases of the Brain in the Head* (see page 5).

The main part of each of these atlases represents the anatomical head and brain slices. They display surface views of 1-cm thick slices through the head either as photographs or colour-coded schematic drawing. Each physical page of the atlas represents one 1-cm thick slice, with the right hand page of the open book page (odd numbered page) displaying the anterior view of the slice and the back page

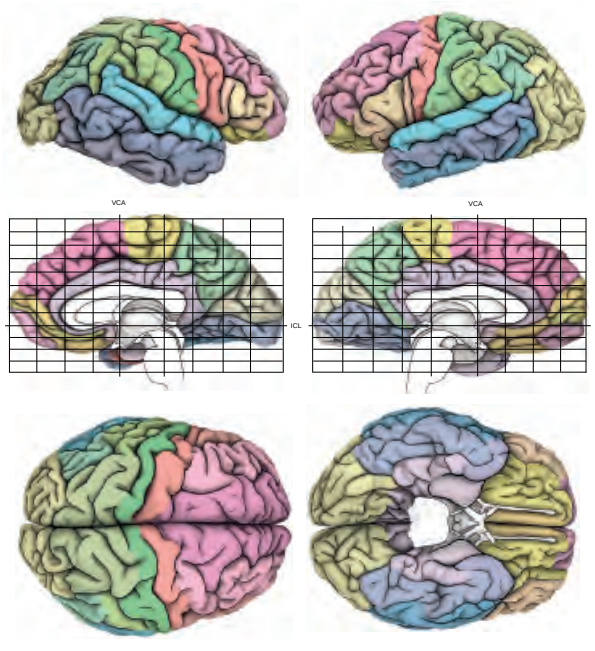

Figure 1.4. The page following the MR images depicts surface views of the brain. The mid-sagittal views, additionally, provide the stereotaxic proportional grid system of Talairach (Talairach and Tournoux, 1988). Every brain structure shown in the following sections can thus be adjusted to the coordinate system of the Talairach stereotaxic space (see section 2.1.8).

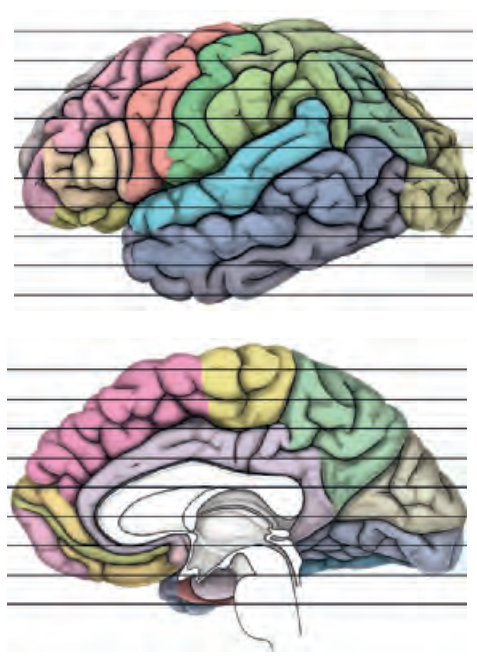

Figure 1.5. The next page presents the lateral and mid-sagittal views of the brain which has been sectioned, together with the placement of each 1-cm slice indicated. One of these section plans is placed (as „Locator“) on each page of the atlas to indicate the location of the depicted slice.

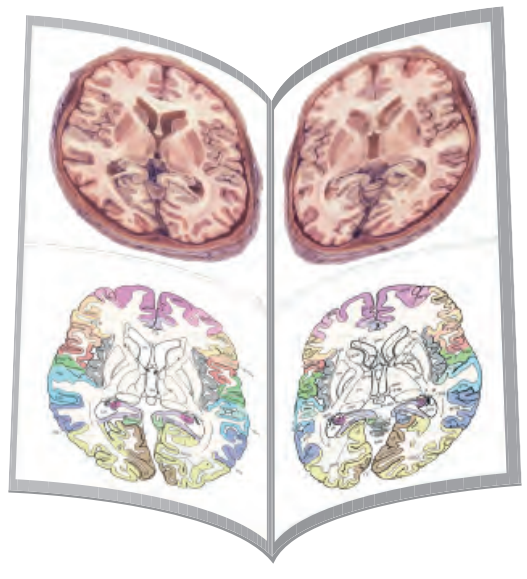

Figure 1.6. The photographs and schematic drawings are mounted such that every section is seen from both sides. They are arranged on the pages in a consistent way: the open atlas (showing two pages) displays the opposing surfaces of the slices as if separated by the knife.

(even numbered page) displaying the posterior view of the same 1-cm slice. In this way, an open book page displays the facing surfaces of adjacent slices (Fig. 1.6). This allows the pursuit of any structure of interest throughout the series of sections. In an analogous way, for the horizontal atlas, the physical page displays the dorsal and ventral view of the same slice. In the coronal plane, the physical page shows the front view (drawing) and the back view (photograph) of the same slice. In the sagittal plane, the physical page displays the lateral and medial views of the same slice.

On the even-numbered pages the photographs and the corresponding drawings of the anatomical slices are supplemented by a radiogram of the 1-cm slice (bottom left) and by two MR-images of the corresponding location from a healthy, 25 year old volunteer. The MR-images differ with respect to T1, T2 and proton density (N(H)) contrast. The radiogram of the real section displays the vascular territories supplied by the main arteries and (in most sections) the segments of extracranial arteries which are located within the particular slice (Fig. 1.7).

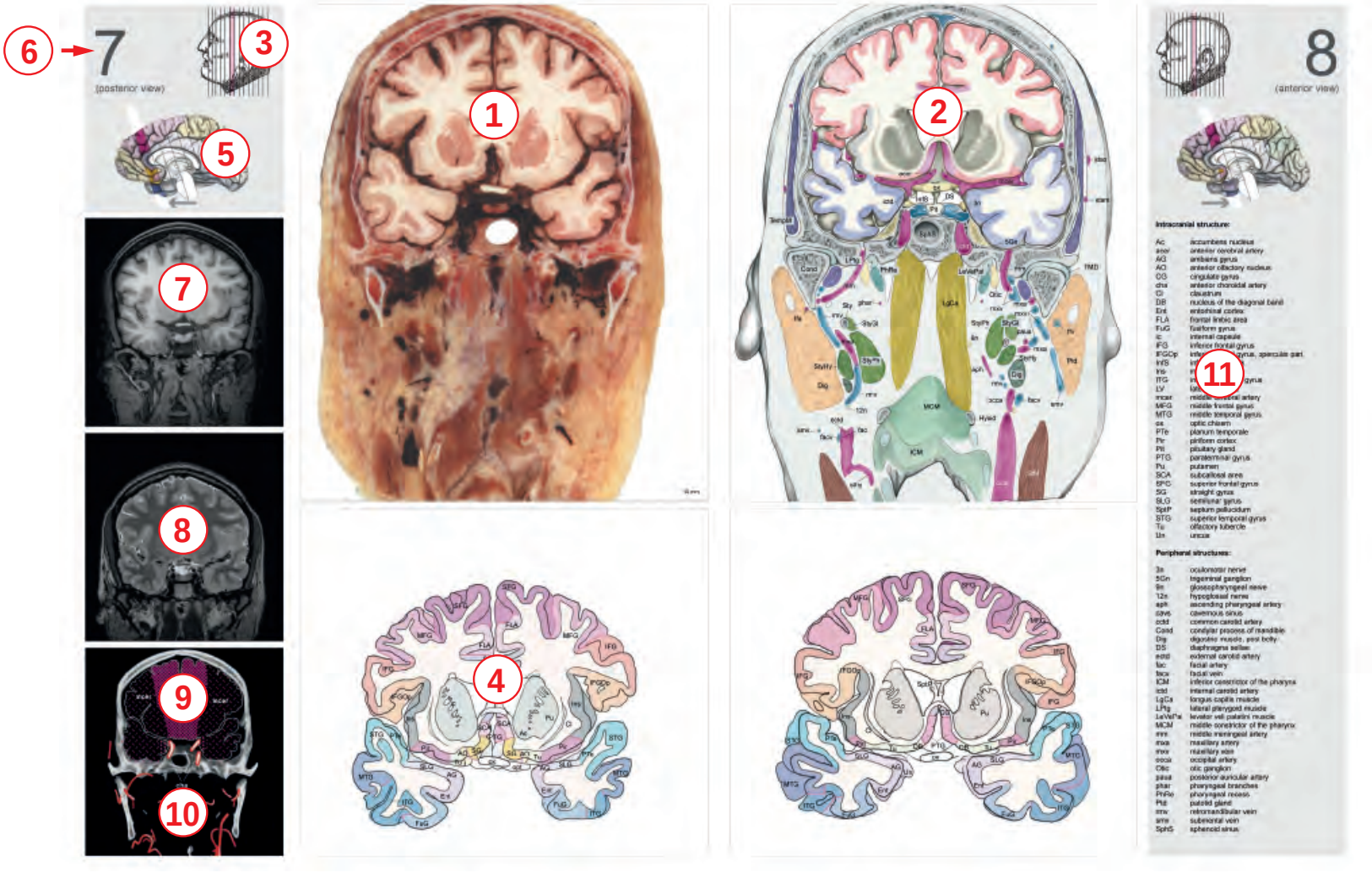

Figure 1.7. Layout of a typical double page in the three *Atlases of the Brain in the Head*. Photograph (1) and drawing (2) of the cut surface of 1-cm thick slices through the head and brain and the corresponding drawings of the brain after removal from the skull (4) are arranged in a way that displays the opposing surfaces of the slices. The locator on each page (3) indicates the position of the slice with the arrow pointing to the surface which is shown on this page. The position of the brain slices (4) is highlighted by the bar on the locator (5). In the diagrams the cortical gyri and sulci and subcortical structures are segmented and color coded (see next page) for easy registration with neighboring slices. On the even pages *in vivo* MR-images of a volunteer are shown which are carefully matched to the anatomic slice. (7,8). The scan parameters are indicated when they first appear in each *Atlas*. The radiograph of the demonstrated slice outlines the vascular territories supplied by the carotic and vertebral arteries (9) and segments of extracranial arteries which are located within the particular slice (10). The index (11) in the coronal and sagittal *Atlases* lists intracranial and extracranial structures separately.

We have tried to represent the images in a way that allows the structures to be easily followed throughout the section planes. One means is by the use of a consistent color scheme (see below). The other is the adjustment of the contour lines in the drawings in a way that they fit to the real 3D organization. Two examples, the 3D organization of the muscles of the head and neck and the organization of the fascia, as derived from *Atlas* figures, are presented in Fig. 1.8 and Fig. 1.9.

Figure 1.8. 3-dimensional reconstruction of muscles of the head and neck using segmentations of the macroscopic atlas. Source: Schumann (2006).

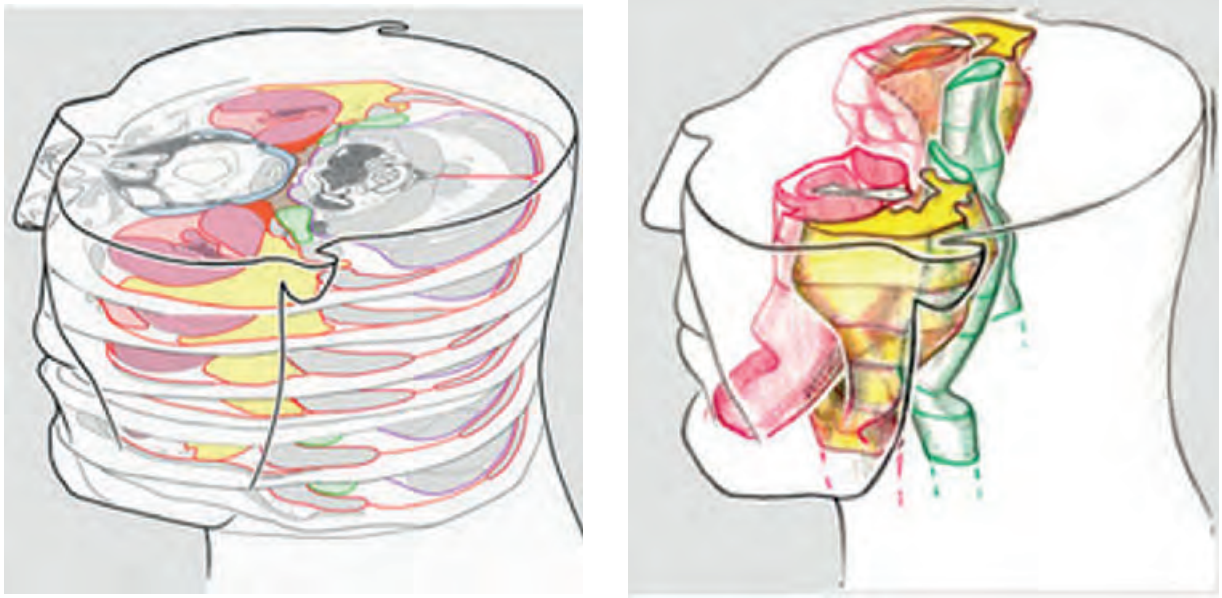

Figure 1.9. Alignment of serial drawings through the head and neck from the horizontal *Atlas* for visualization of fascial tissue spaces. Source: http://teaching.thehumanbrain.info/

Muscles of head

Masticatory muscles
- masseter muscle
- lateral pterygoid muscle
- medial pterygoid muscle
- temporalis muscle

Facial muscles
- auricularis muscle
- buccinator muscle
- corrugator supercilii muscle
- depressor anguli oris muscle
- depressor labii inferioris muscle
- depressor supercilii muscle
- levator anguli oris muscle
- levator labii superioris muscle
- mentalis muscle
- nasalis muscle
- occipitofrontalis muscle
- orbicularis oculi muscle
- orbicularis oris muscle
- platysma
- risorius muscle
- major zygomaticus muscle
- minor zygomaticus muscle

Extra-ocular muscles
- levator palpebrae superioris muscle
- inferior oblique muscle
- superior oblique muscle
- inferior rectus muscle
- lateral rectus muscle
- medial rectus muscle
- superior rectus muscle

Laryngeal muscles
- aryepiglotticus muscle
- arytenoid muscle

Muscles of soft palate and fauces
- levator veli palatini muscle
- palatoglossus muscle
- tensor veli palatini muscle
- uvulae muscle

Muscles of neck
- digastric muscle
- geniohyoid muscle
- longus capitis muscle
- longus colli muscle
- mylohyoid muscle
- inferior oblique capitis muscle
- superior oblique capitis muscle
- omohyoid muscle
- anterior rectus capitis muscle
- lateral rectus capitis muscle
- rectus capitis post. major muscle
- rectus capitis post. minor muscle
- scaleni muscles
- sternocleidomastoid muscle
- stylohyoid muscle
- thyrohyoid muscle

Muscles of back
- iliocostalis cervicis muscle
- interspinalis muscle
- intertransversari muscles
- levator scapulae muscle
- longissimus capitis muscle
- longissimus cervicis muscle
- multifidus muscle
- semispinalis capitis muscle
- semispinalis cervicis muscle
- spinalis muscle
- splenius capitis muscle
- splenius cervicis muscle
- trapezius muscle

Muscles of pharynx
- inferior constrictor muscle
- middle constrictor muscle
- superior constrictor muscle
- palatopharyngeus muscle
- salpingopharyngeus muscle
- stylopharyngeus muscle

Muscles of tongue
- genioglossus muscle
- hyoglossus muscle
- intrinsic muscles
- palatoglossus muscle
- styloglossus muscle

Gyri
- anterior angular gyrus
- anterior cortical amygdaloid n.
- ambiens gyrus
- Area orbitoinsularis
- anterior orbital gyrus, lateral part
- anterior orbital gyrus, medial part
- area piriformis insulae
- Arcus parieto-occipitalis, ant. division
- Arcus parieto-occipitalis, post. division
- striate area
- basal operculum
- cingulate gyrus
- anterior central operculum
- posterior central operculum
- dentate gyrus
- entorhinal cortex
- frontomarginal gyrus
- frontal operculum
- fusiform gyrus, post. part
- fusiform gyrus
- gyrus descendens
- hippocampus
- hippocampal head
- isthmus of cingulate gyrus
- inferior frontal gyrus, opercular part
- inferior frontal gyrus, orbital part
- inferior frontal gyrus, triangular part
- inferior frontopolar gyrus
- insular gyrus
- inferior lingual gyrus, lateral part
- inferior lingual gyrus, medial part
- inferior lingual gyrus
- inferior occipital gyrus
- inferior temporal gyrus
- inferior temporopolar region
- insula
- lateral orbital gyrus
- lingual gyrus (O5)
- limen insulae
- middle frontal gyrus
- middle frontopolar gyrus
- medial occipital gyrus
- medial orbital gyrus
- middle sagittal gyrus
- middle temporal gyrus
- occipital gyrus
- olfactory area
- periamygdaloid cortex
- posterior angular gyrus
- precommissural archicortex
- precallosal gyrus
- postcentral insular cortex
- paracentral lobule
- precuneus
- parahippocampal-amygdaloid transition area
- parahippocampal gyrus
- parainsular region
- posteromedial orbital lobule
- parietal operculum
- posterior orbital gyrus
- planum polare, lat. part
- planum polare
- perirhinal cortex
- parastriate area
- paraterminal gyrus
- planum temporale
- piriform cortex, frontal part
- piriform cortex, temporal part
- postcentral gyrus
- precentral gyrus
- presubiculum
- rostral gyrus
- subiculum
- subcallosal area
- superior frontal gyrus
- superior frontal gyrus, lateral part
- superior frontal gyrus, medial part
- superior frontopolar gyrus
- straight gyrus
- superior lingual gyrus
- supramarginal gyrus
- superior occipital gyrus, lat. part
- superior occipital gyrus, medial part
- superior parietal lobule
- superior temporal gyrus
- transverse insular gyrus
- temporooccipital transition zone
- tempopolar gyrus
- ant. transverse temporal gyrus
- post. transverse temporal gyrus

1.1.6 References

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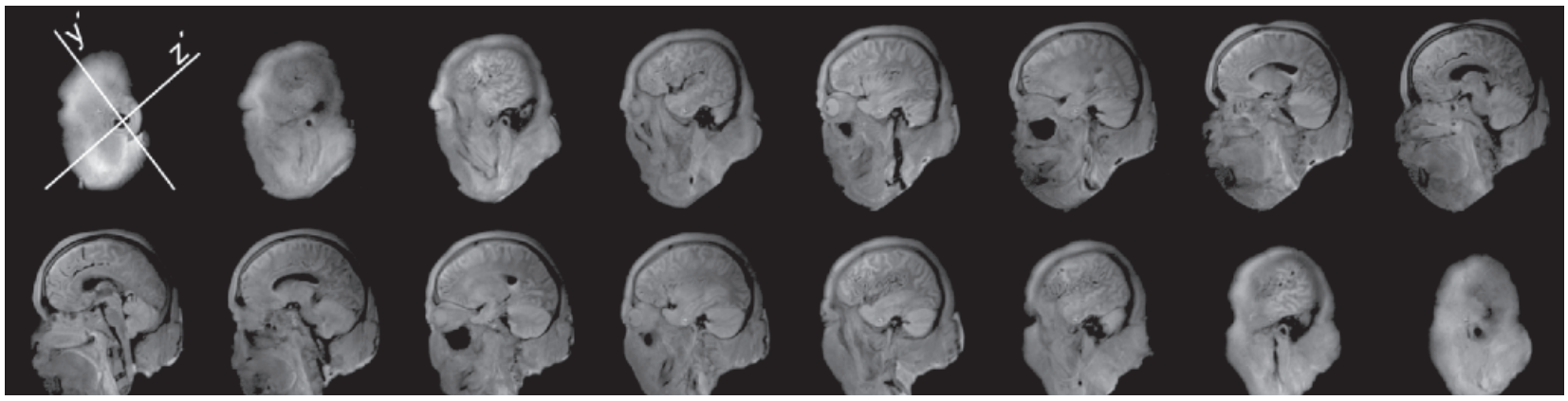
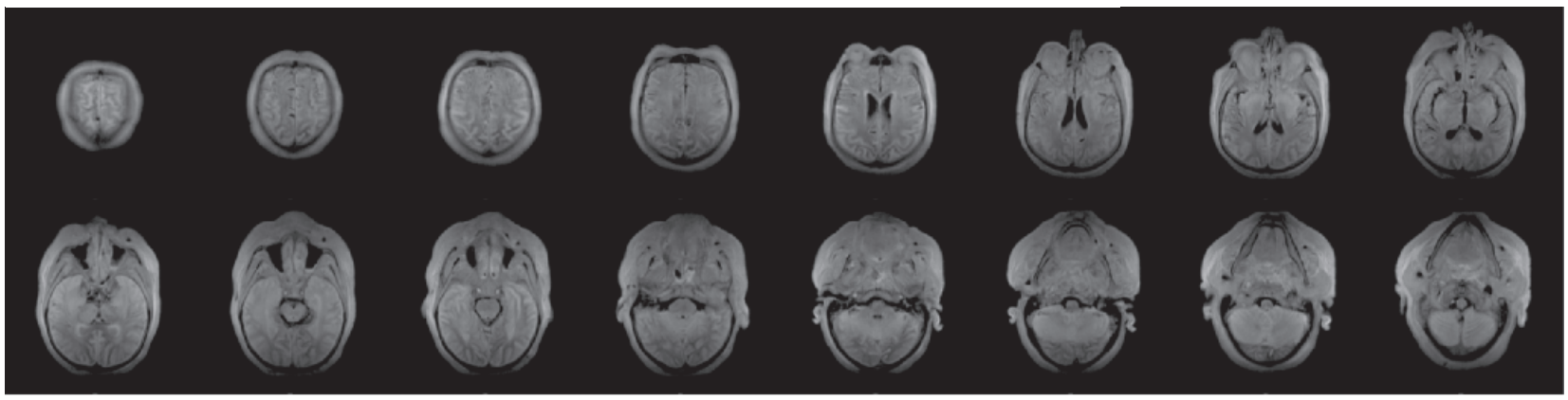
1.2 Horizontal Atlas of the Brain in the Head

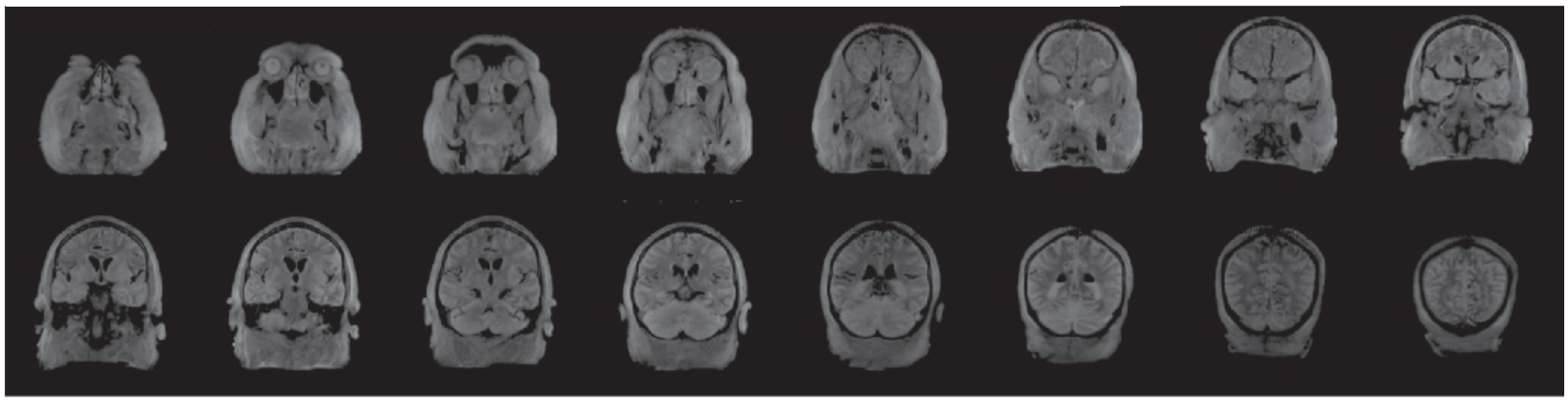
Sagittal plane:



y´- direction:

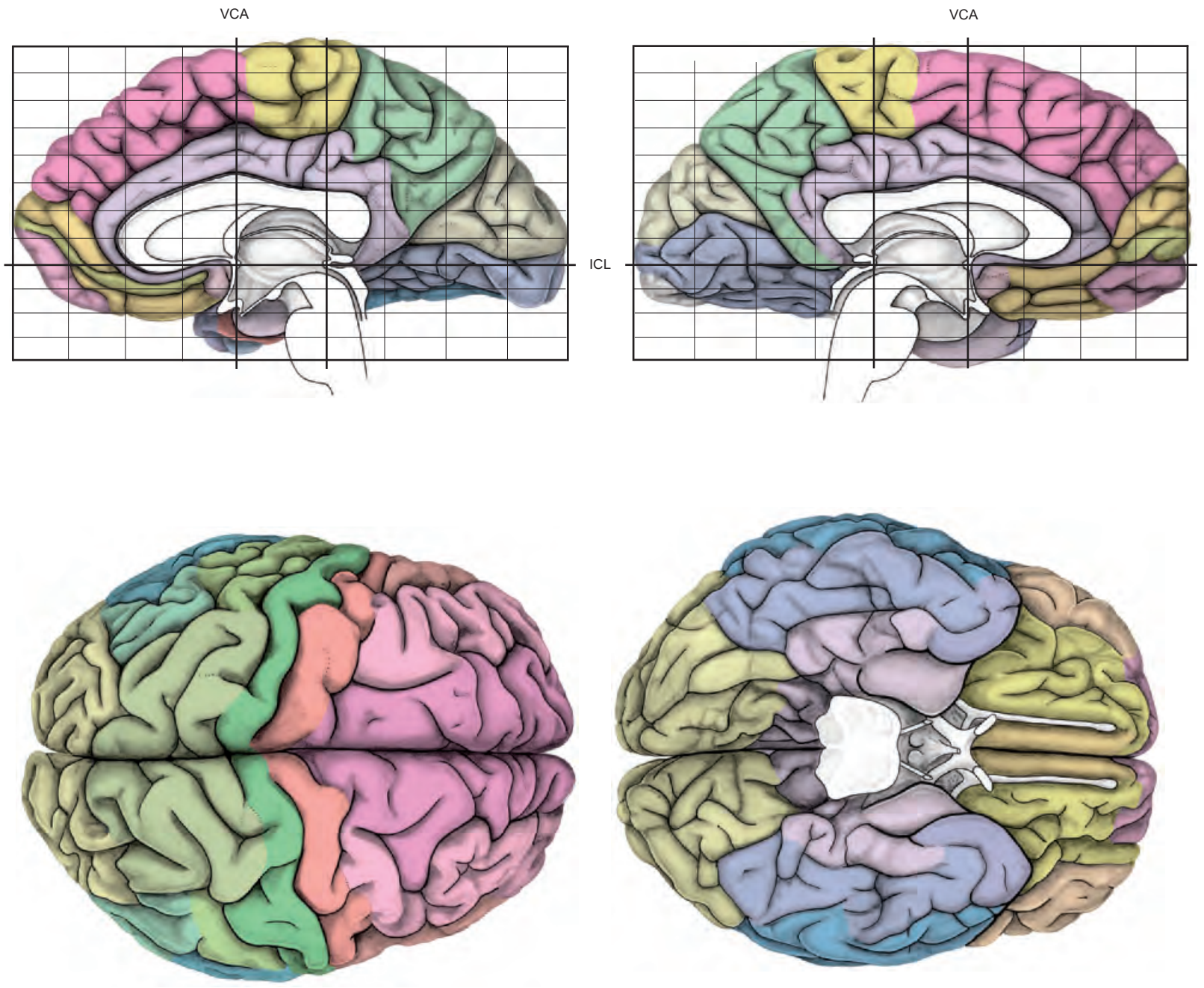


z´- direction:

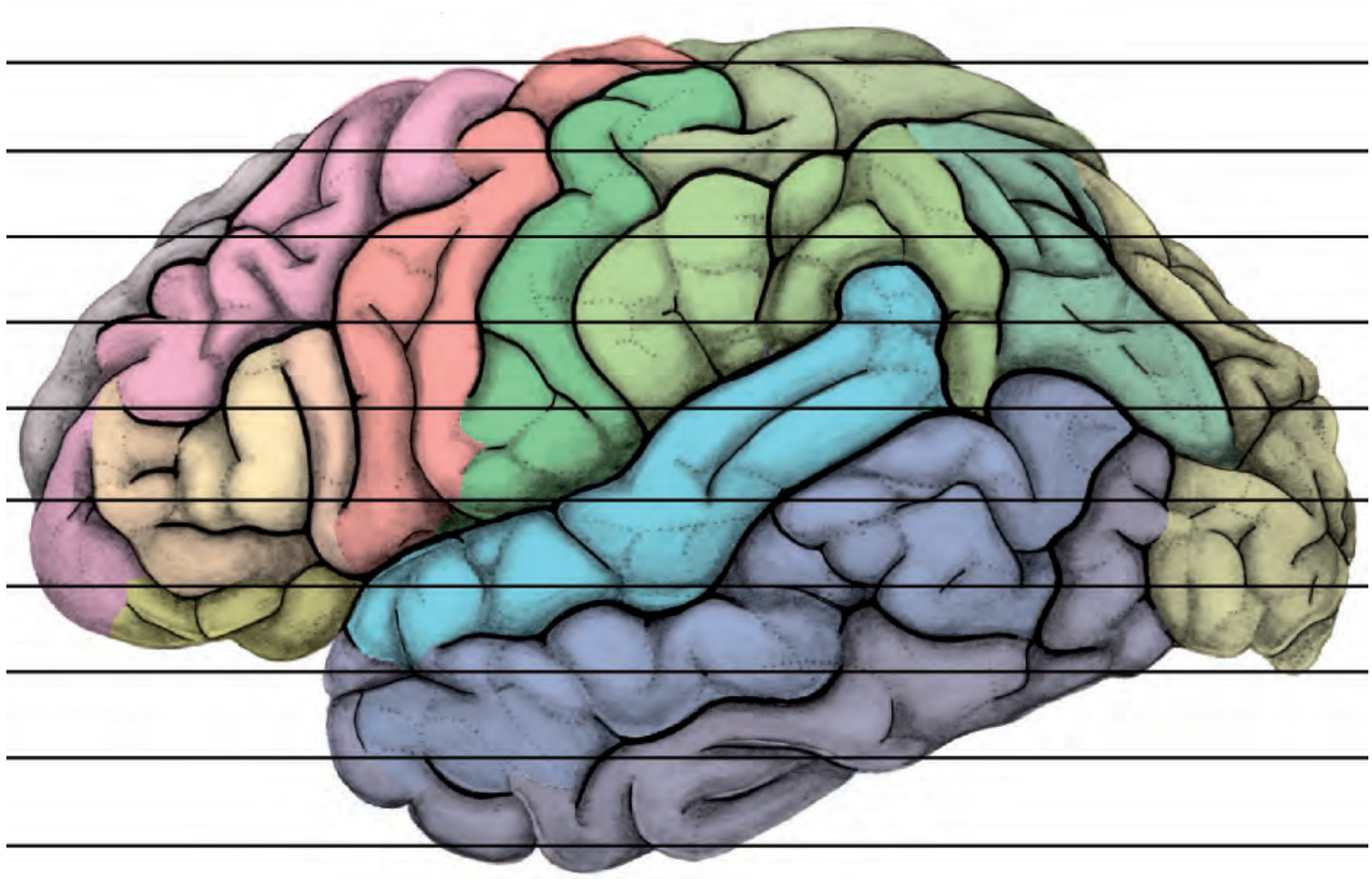


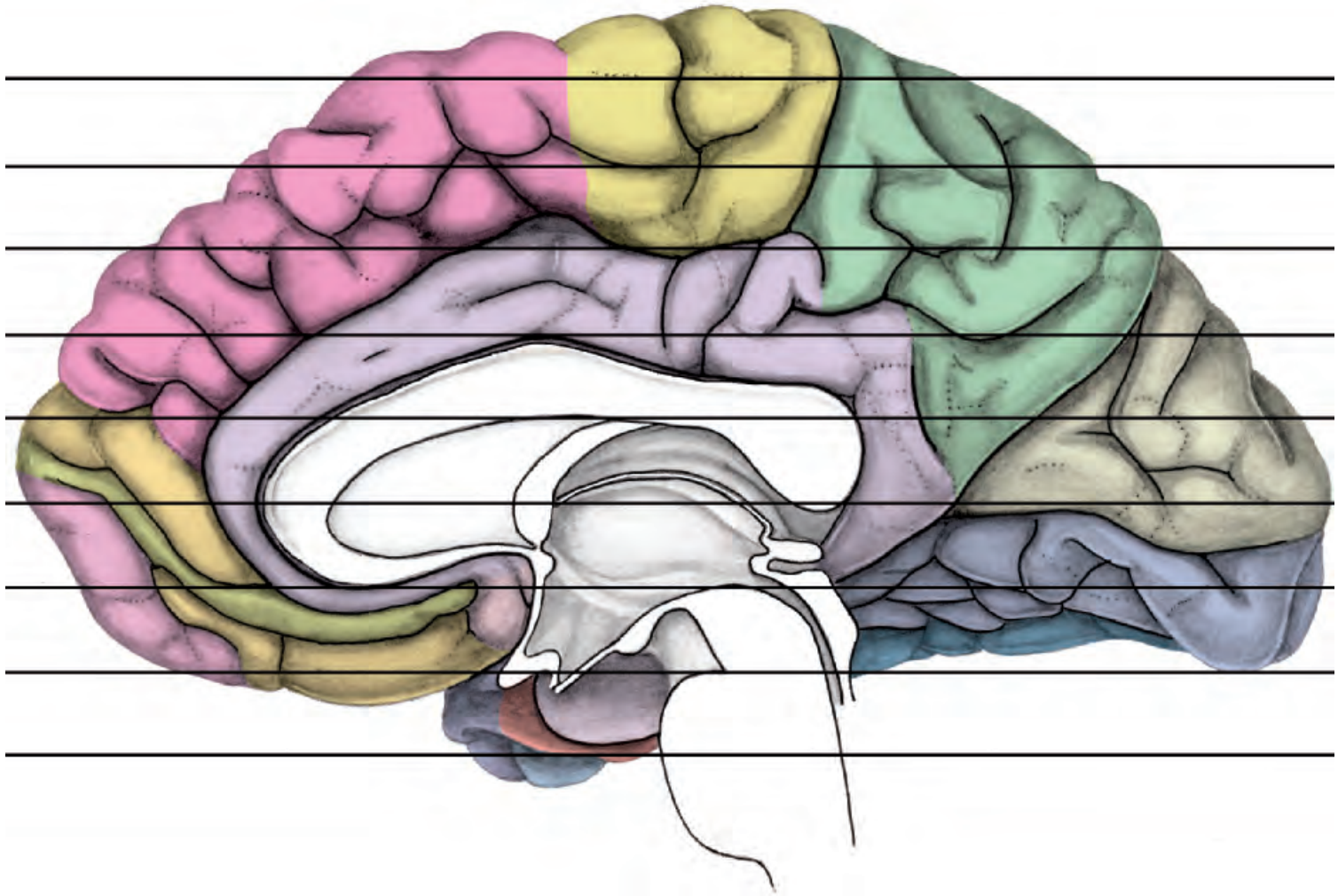
MR-images of the head shown on the following pages.

The head whose horizontal sections are depicted on pages 11-40 was imaged before sectioning. Parameters: 0.15 Tesla, matrix 256 x 256, field of view 25 cm, multi-slice, slice thickness 5 mm, 4 excitations, sequence: 5000/40. The contrast of these images is poor since they are highly proton-density (N(H)) weighted. The top panel presents the sagittal MRIs and specifies the planes of sectioning of the middle and lower panel. As can be seen the angle of sectioning of the two lower panels is about 45° tilted against the plane of sectioning for the anatomic slices. This was aimed to provide a more comprehensive view of the head.

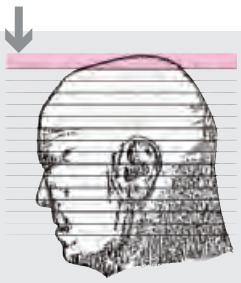


Surface views of the brain which is shown in the subsequent pages. The most important gyri are delineated. The midsagittal views depict the brain with the stereotaxic space (ICL: intercommissural line, VCA: plane which is vertical to the intercommissural line at the level of the center of the anterior commissure).



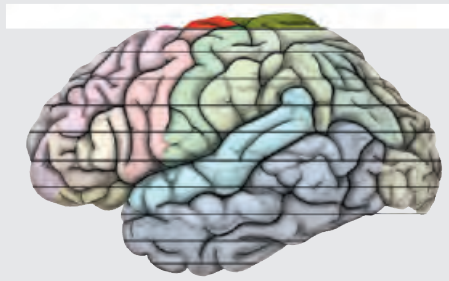


Surface views of the right hemisphere of the brain which has been sectioned in the horizontal plane as indicated. The drawing of the lateral aspect has been *mirror-imaged* in order to demonstrate the correspondence of section levels between convexity and midline structures.

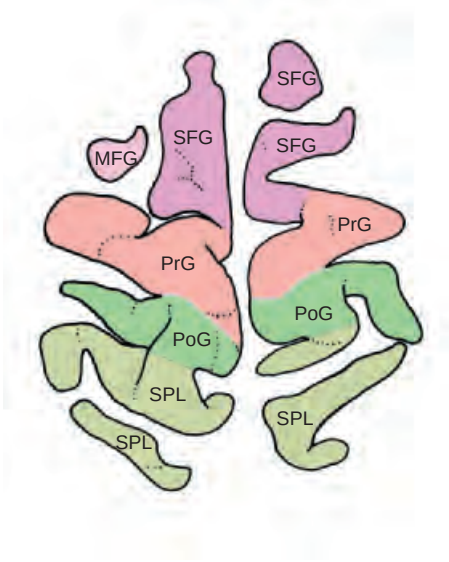


1

(dorsal view)

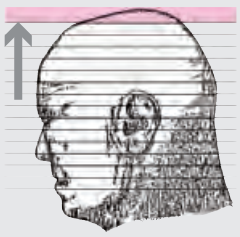


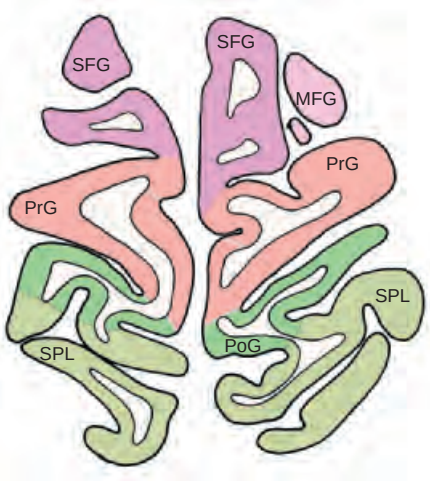
MFG	middle frontal gyrus
PoG	postcentral gyrus
PrG	precentral gyrus
SFG	superior frontal gyrus
SPL	superior parietal lobule

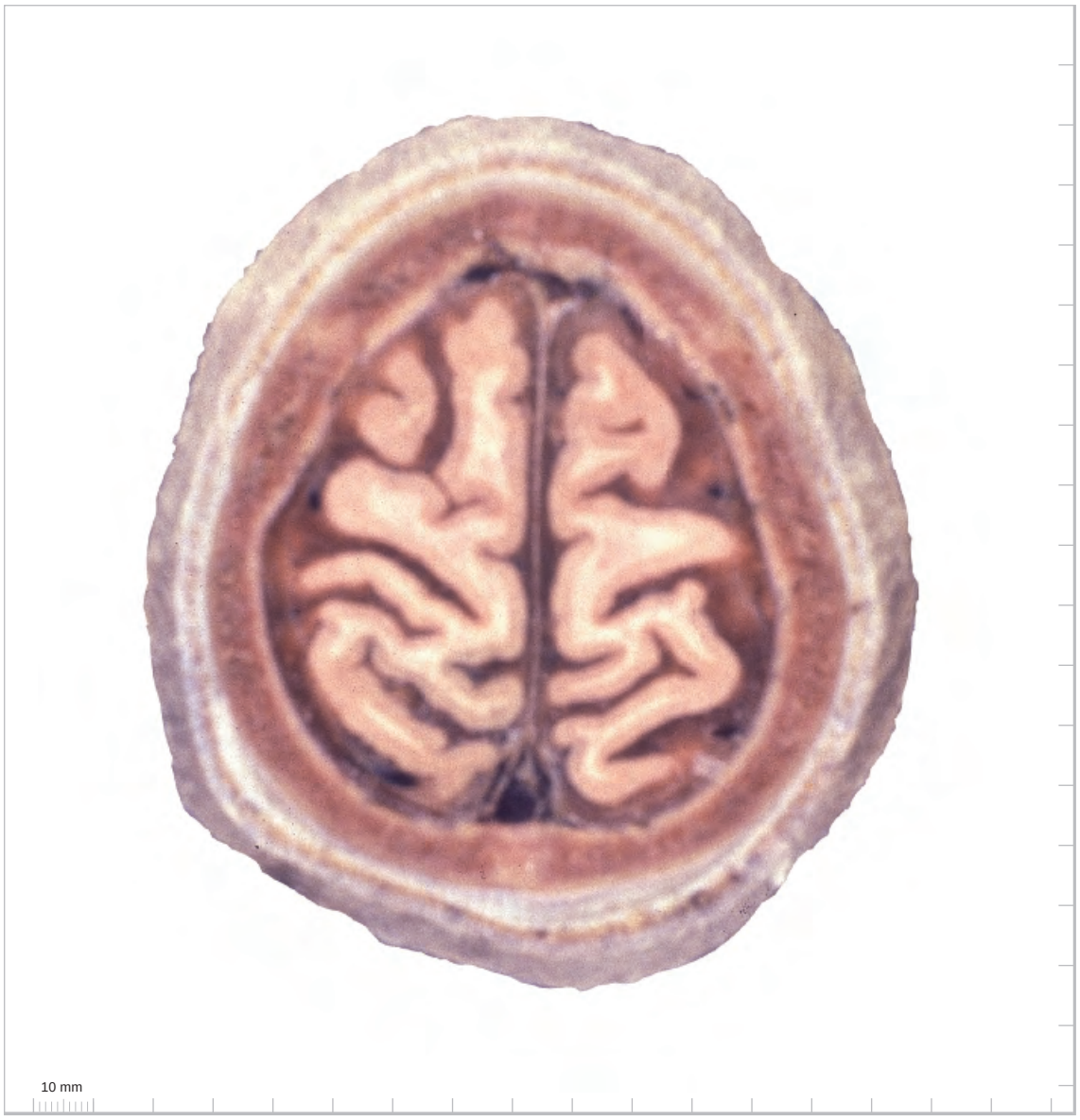


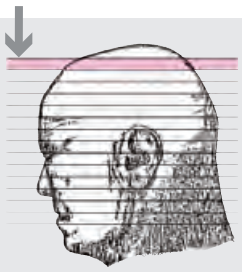
1

(ventral view)









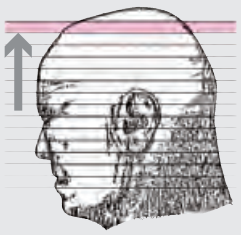
2

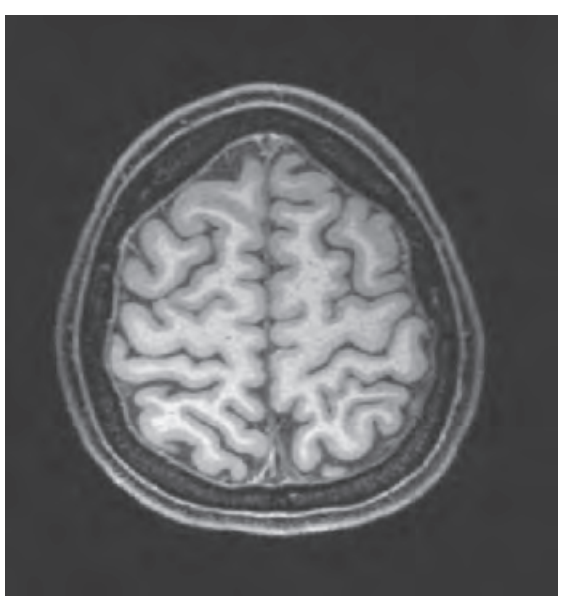
(dorsal view)

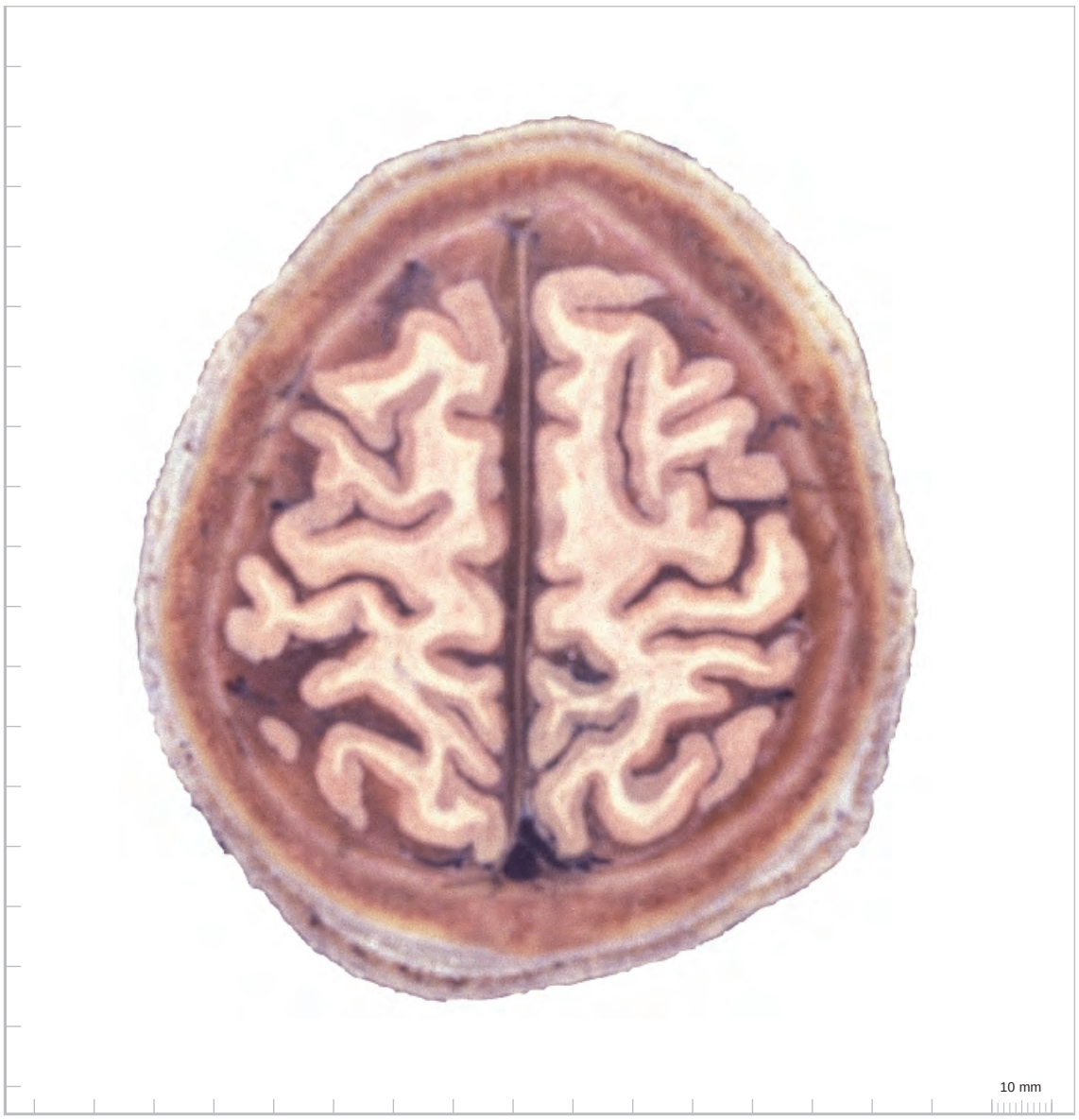
acer	anterior cerebral artery
MFG	middle frontal gyrus
PoG	postcentral gyrus
PrG	precentral gyrus
SFG	superior frontal gyrus
SPL	superior parietal lobule

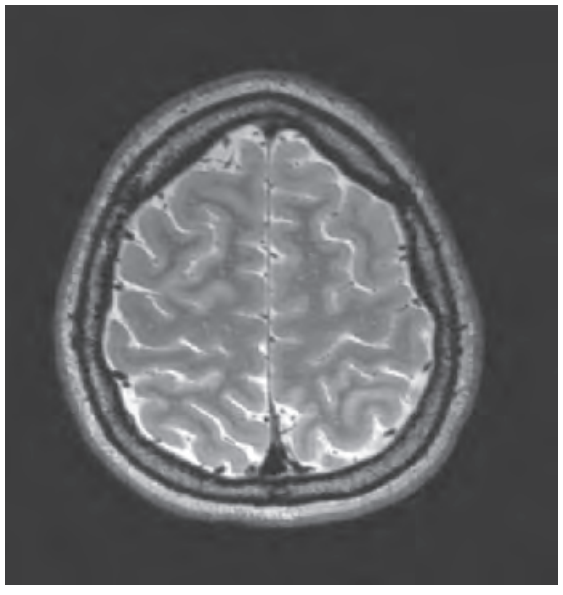
2

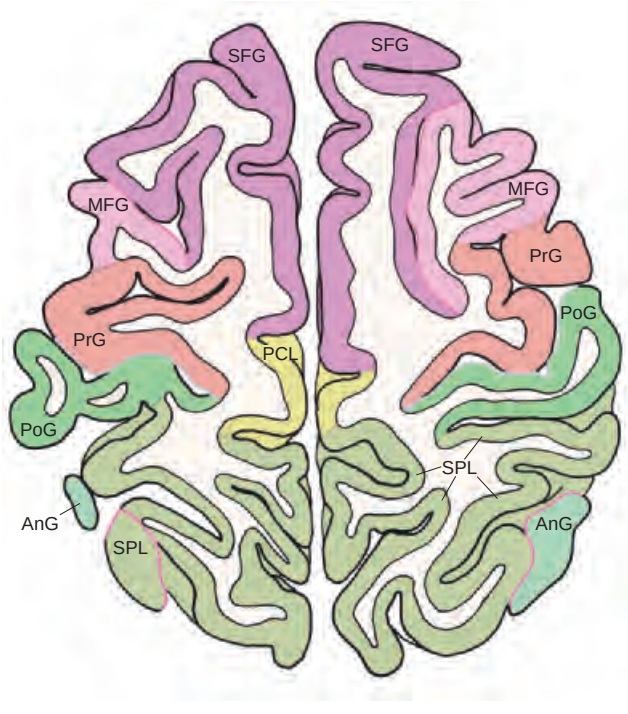
(ventral view)

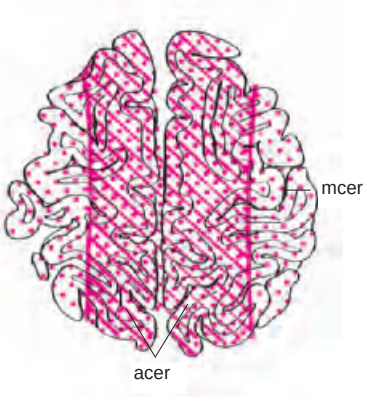


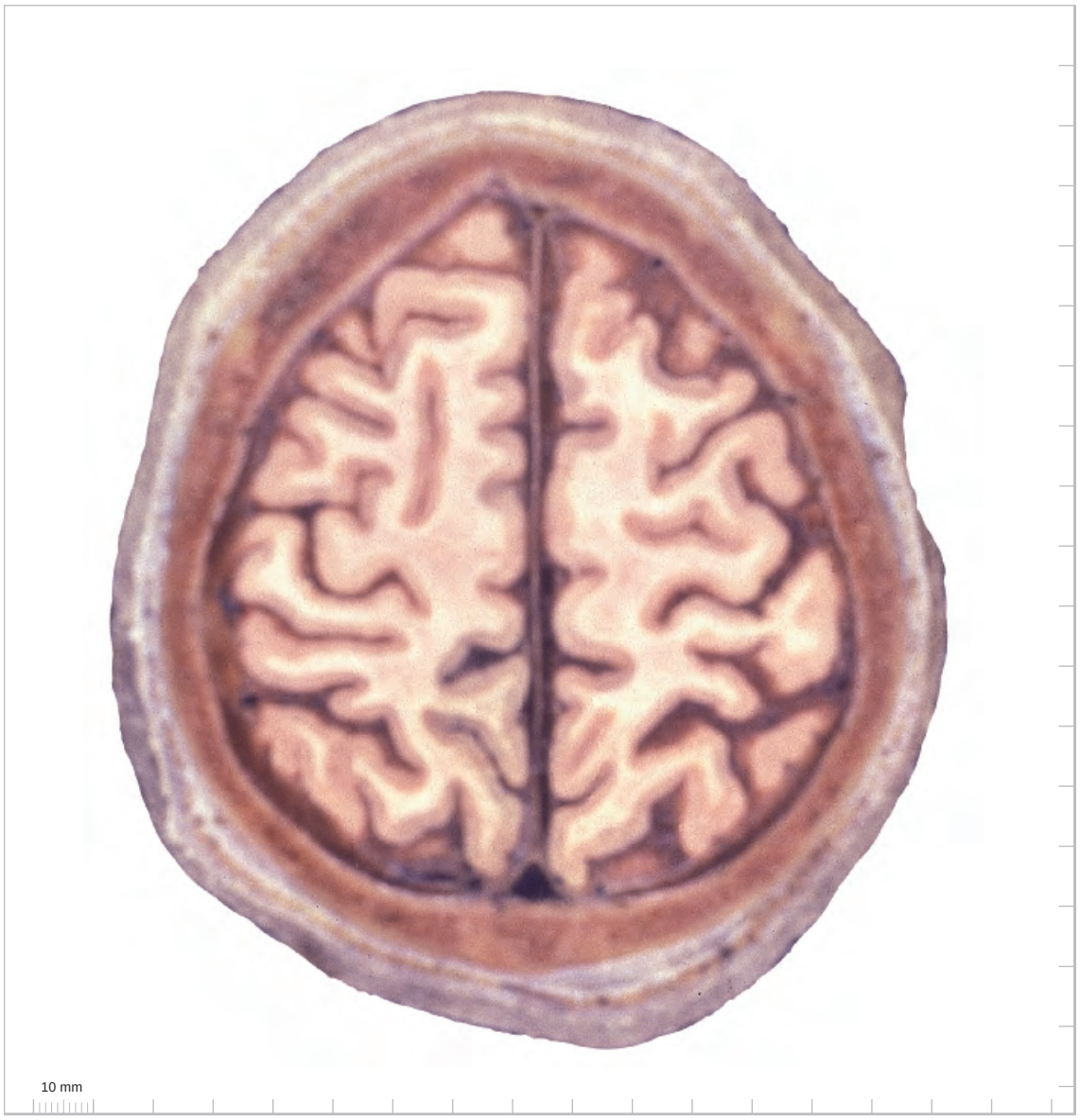


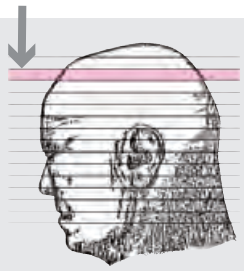








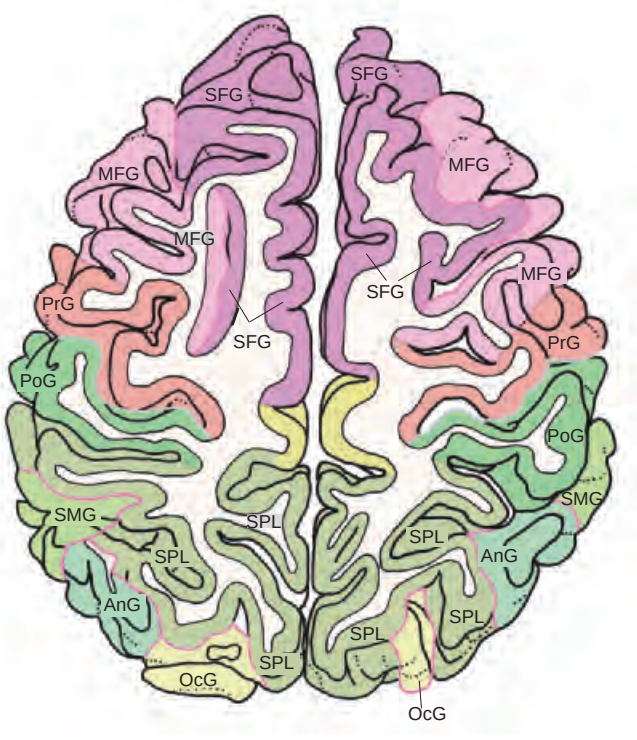




3

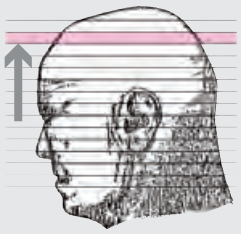
(dorsal view)

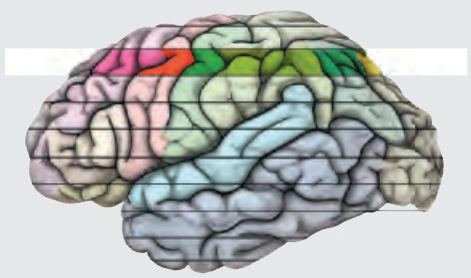
acer	anterior cerebral artery
AnG	angular gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
OcG	occipital gyri
PCL	paracentral lobule
PoG	postcentral gyrus
PrG	precentral gyrus
SFG	superior frontal gyrus
SMG	supramarginal gyrus
SPL	superior parietal lobule

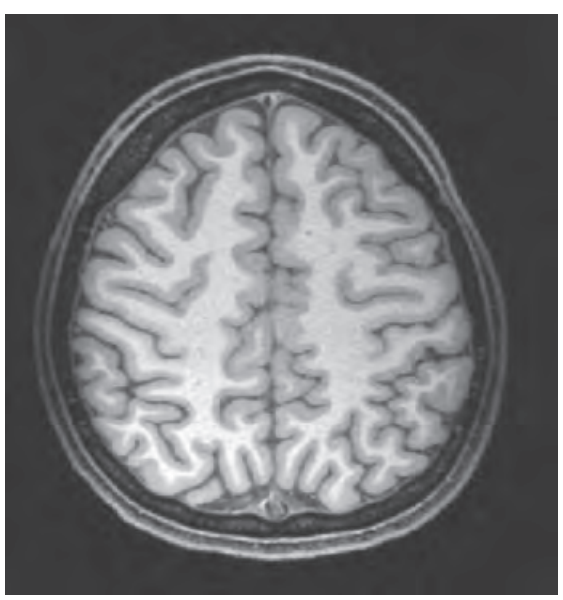


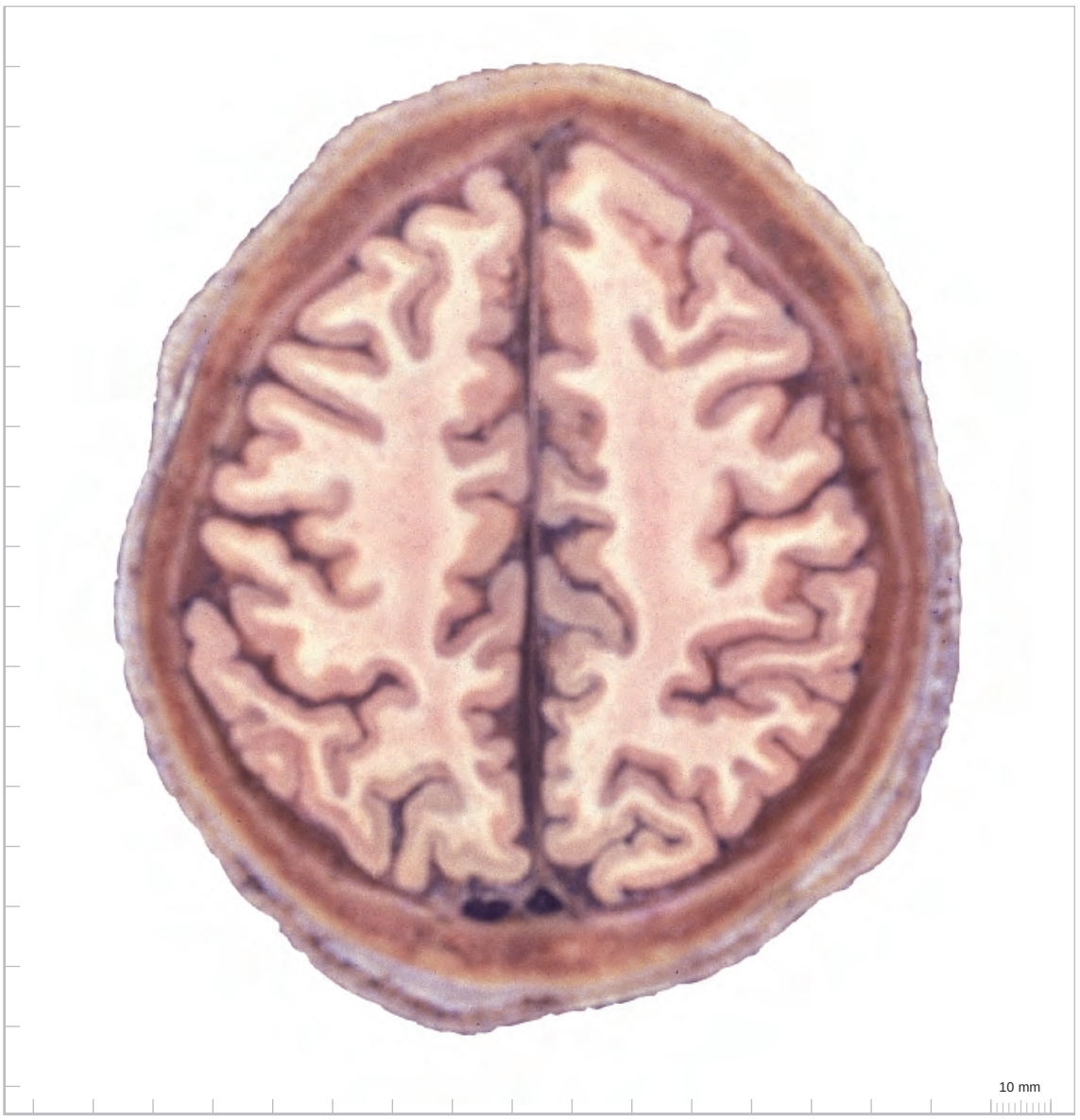
3

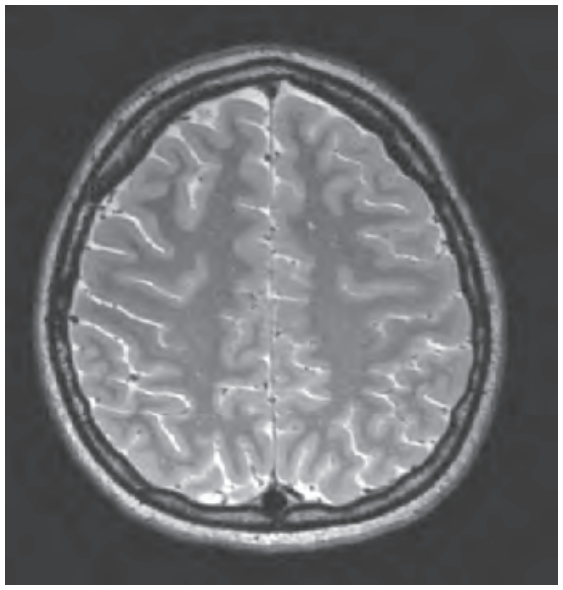
(ventral view)

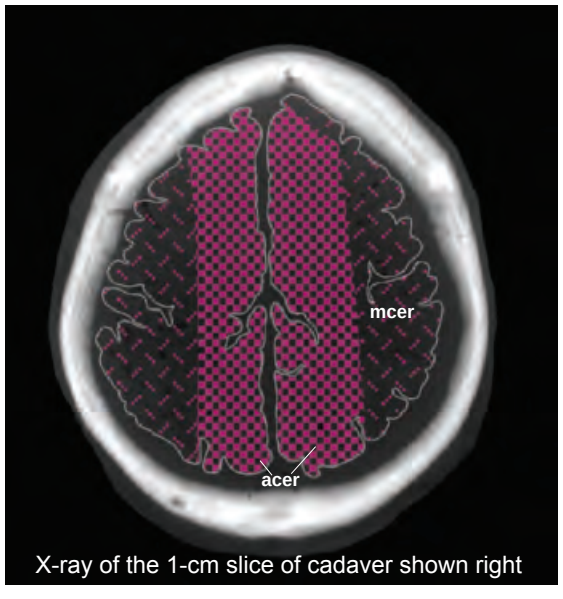




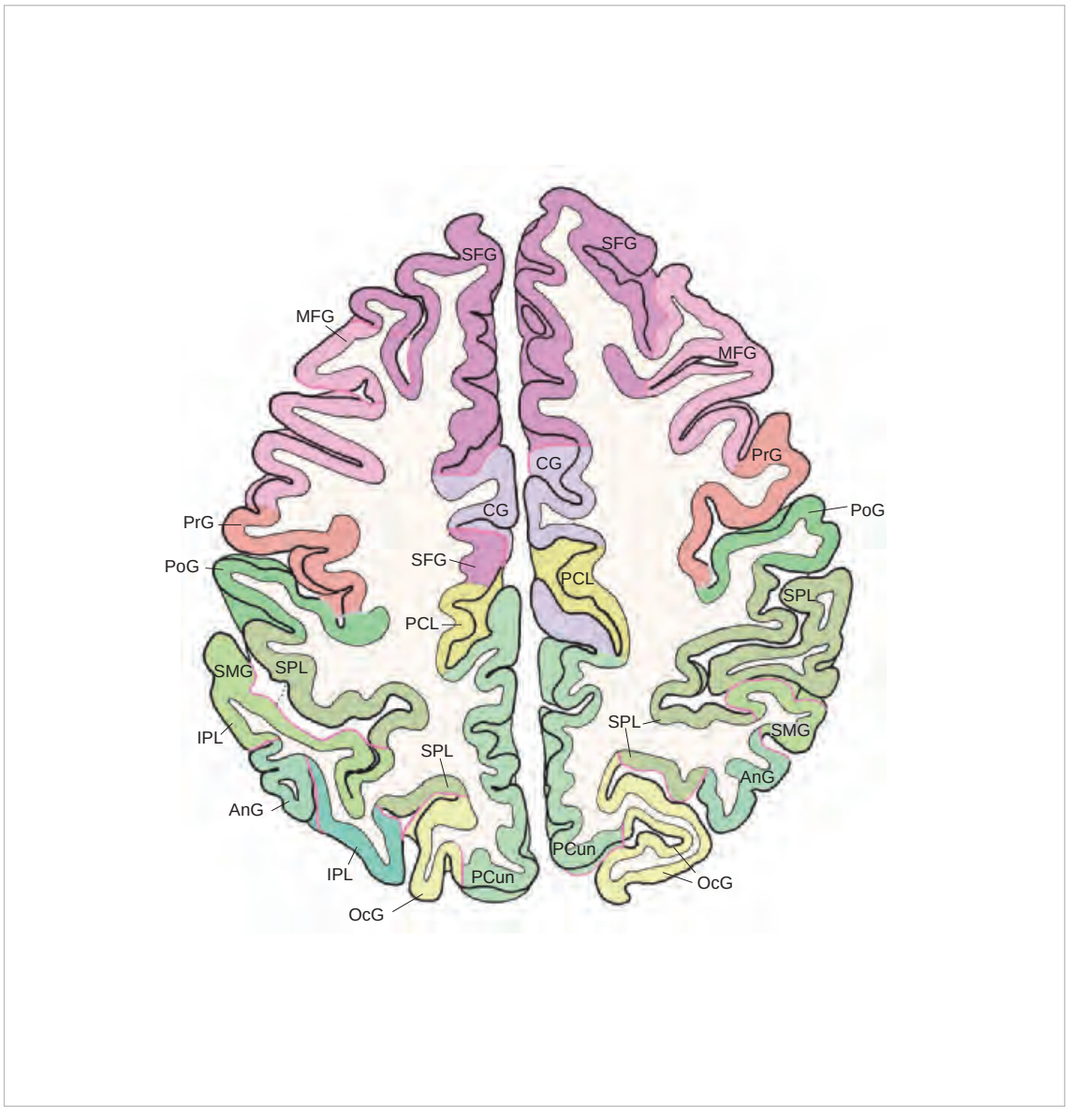


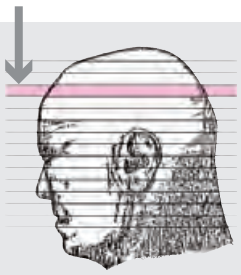






X-ray of the 1-cm slice of cadaver shown right

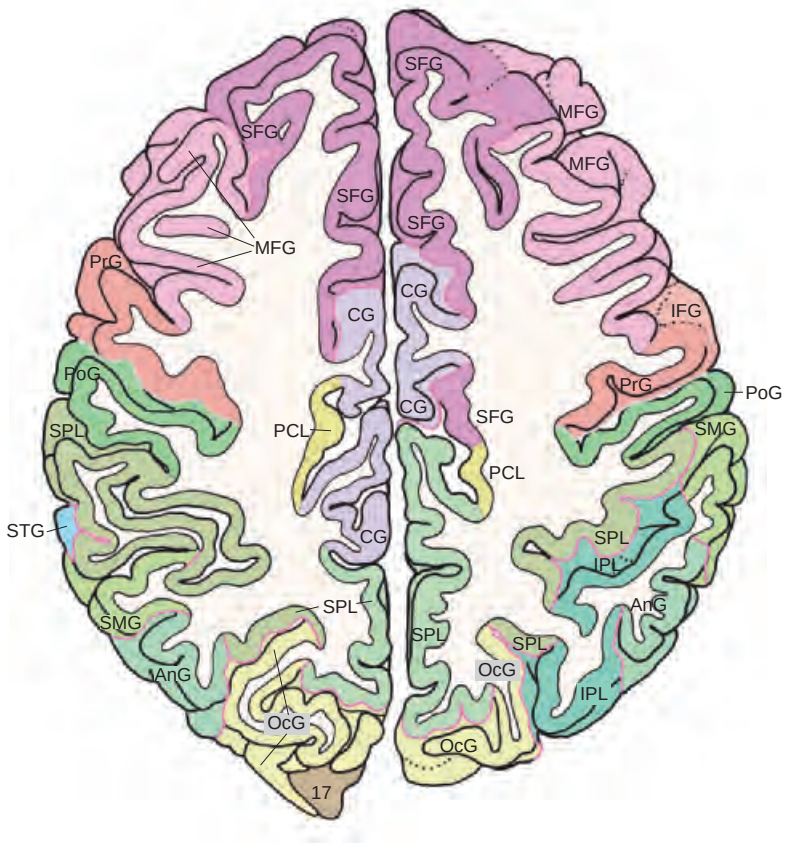




4

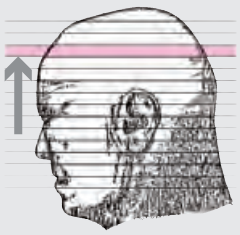
(dorsal view)

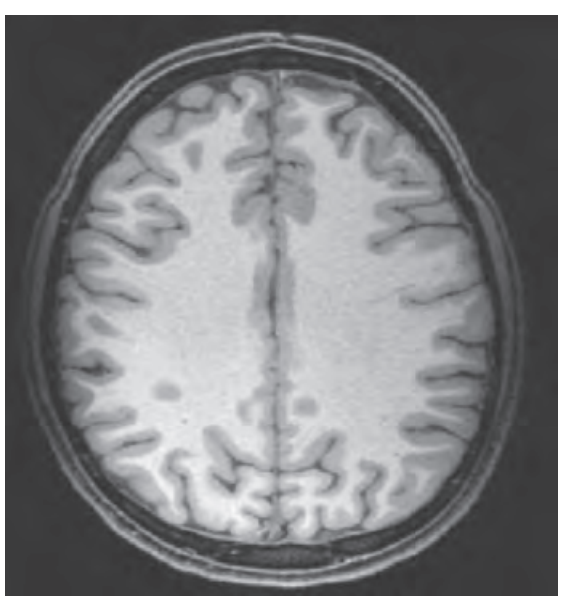
17	striate area
acer	anterior cerebral artery
AnG	angular gyrus
CG	cingulate gyrus
IFG	inferior frontal gyrus
IPL	inferior parietal lobule
mcer	middle cerebral artery
MFG	middle frontal gyrus
OcG	occipital gyri
PCL	paracentral lobule
PCun	precuneus
PoG	postcentral gyrus
PrG	precentral gyrus
SFG	superior frontal gyrus
SMG	supramarginal gyrus
SPL	superior parietal lobule
STG	superior temporal gyrus

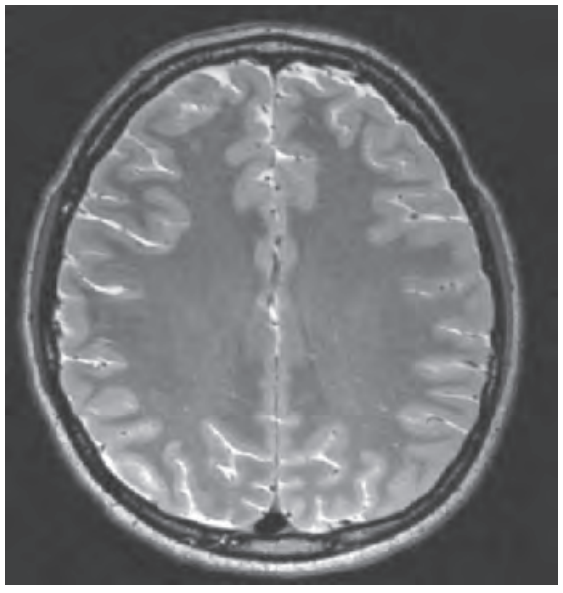


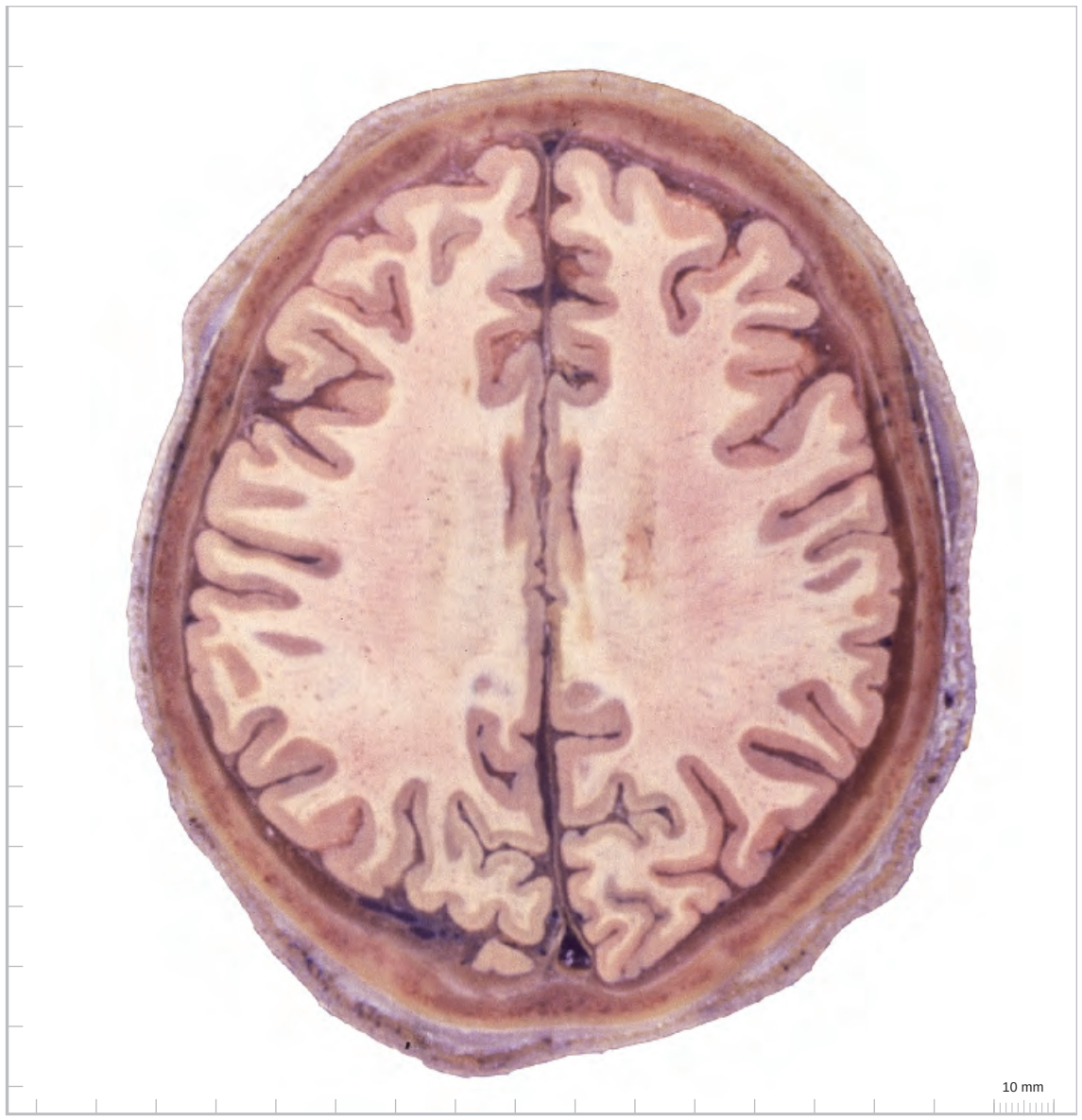
4

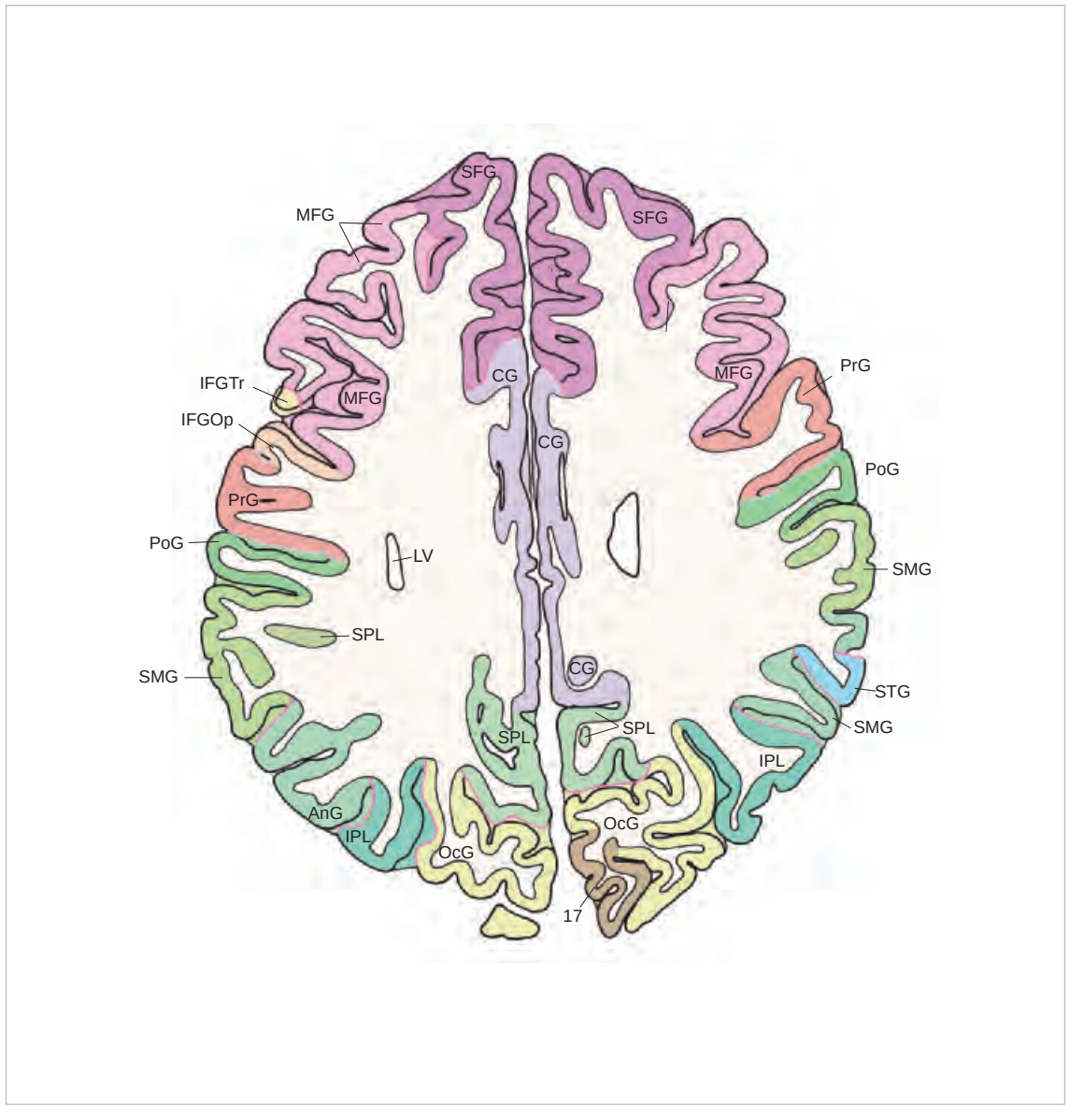
(ventral view)

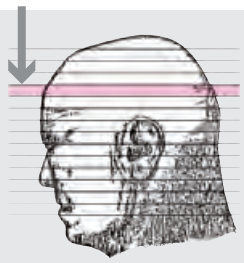








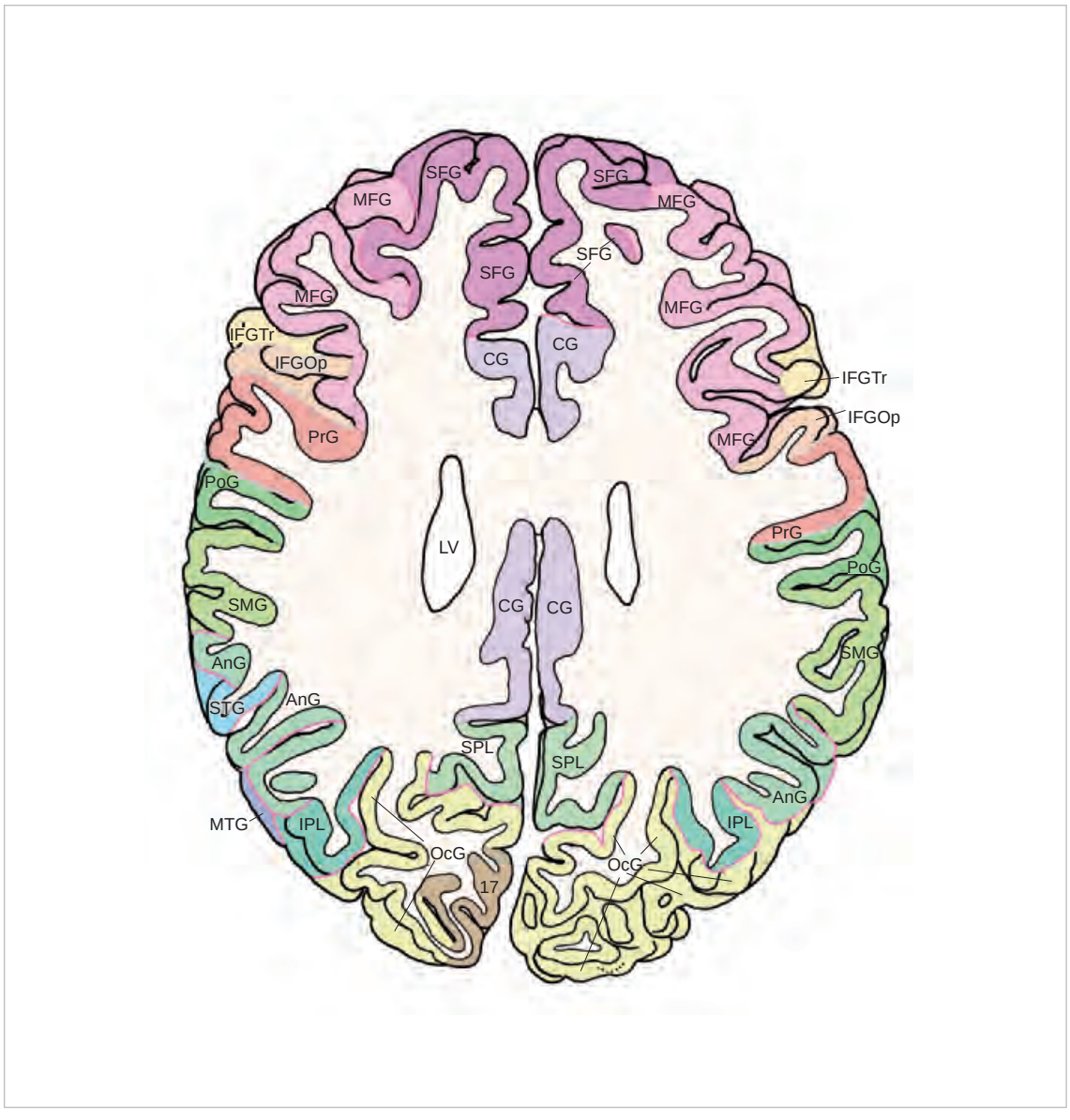




5

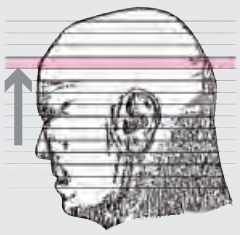
(dorsal view)

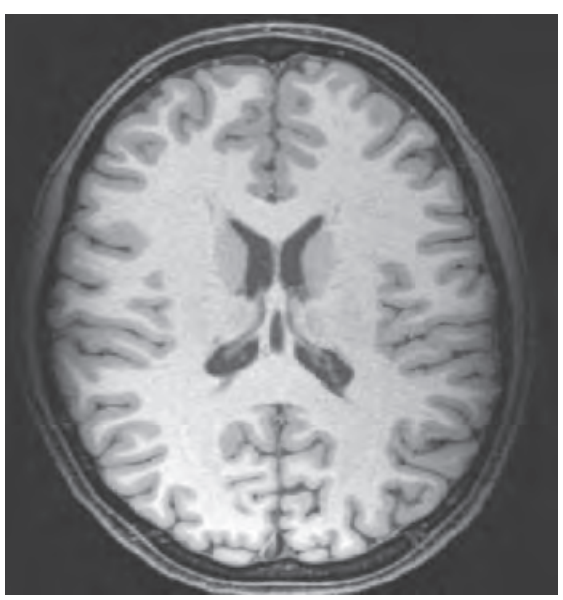
17	striate area
acer	anterior cerebral artery
AnG	angular gyrus
CG	cingulate gyrus
IFGOp	inferior frontal gyrus, opercular part
IFGTr	inferior frontal gyrus, triangular part
IPL	inferior parietal lobule
LV	lateral ventricle
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
pcer	posterior cerebral artery
PoG	postcentral gyrus
PrG	precentral gyrus
SFG	superior frontal gyrus
SMG	supramarginal gyrus
SPL	superior parietal lobule
STG	superior temporal gyrus

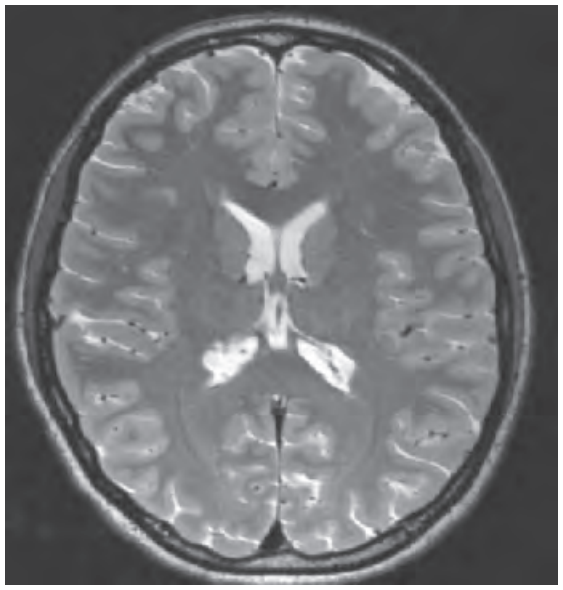


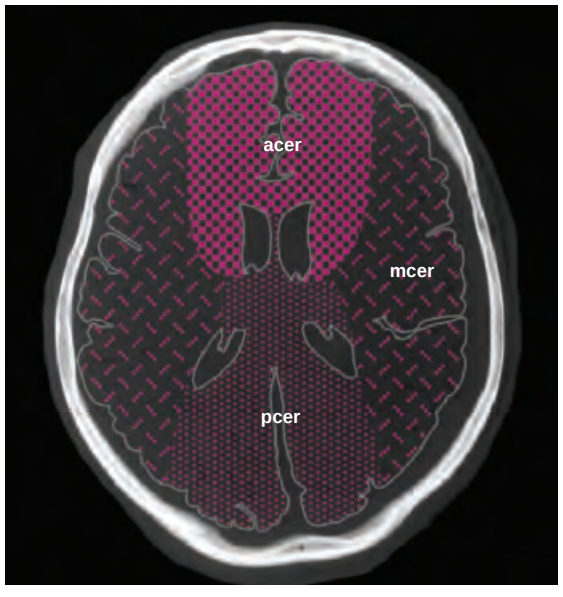
5

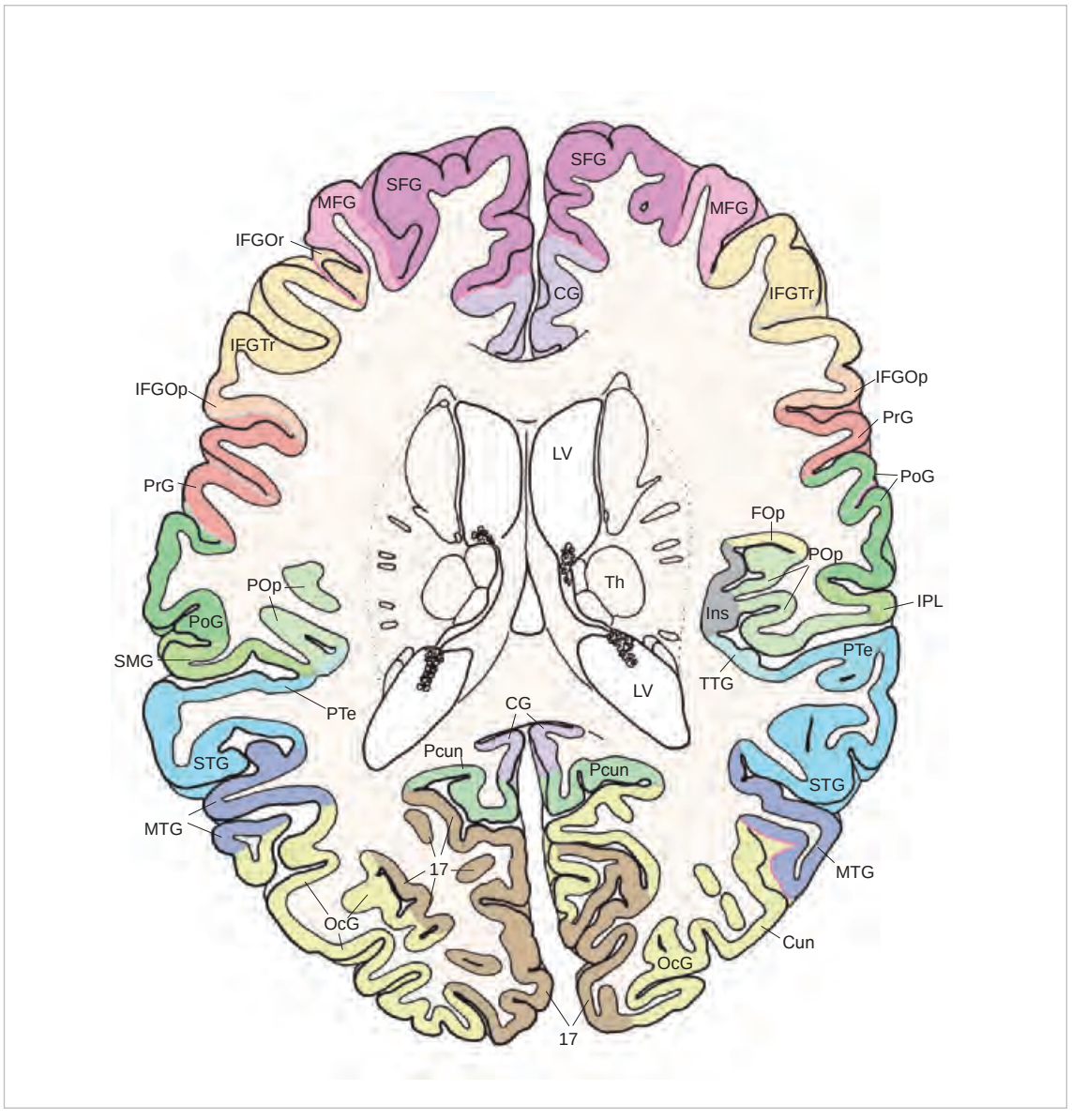
(ventral view)

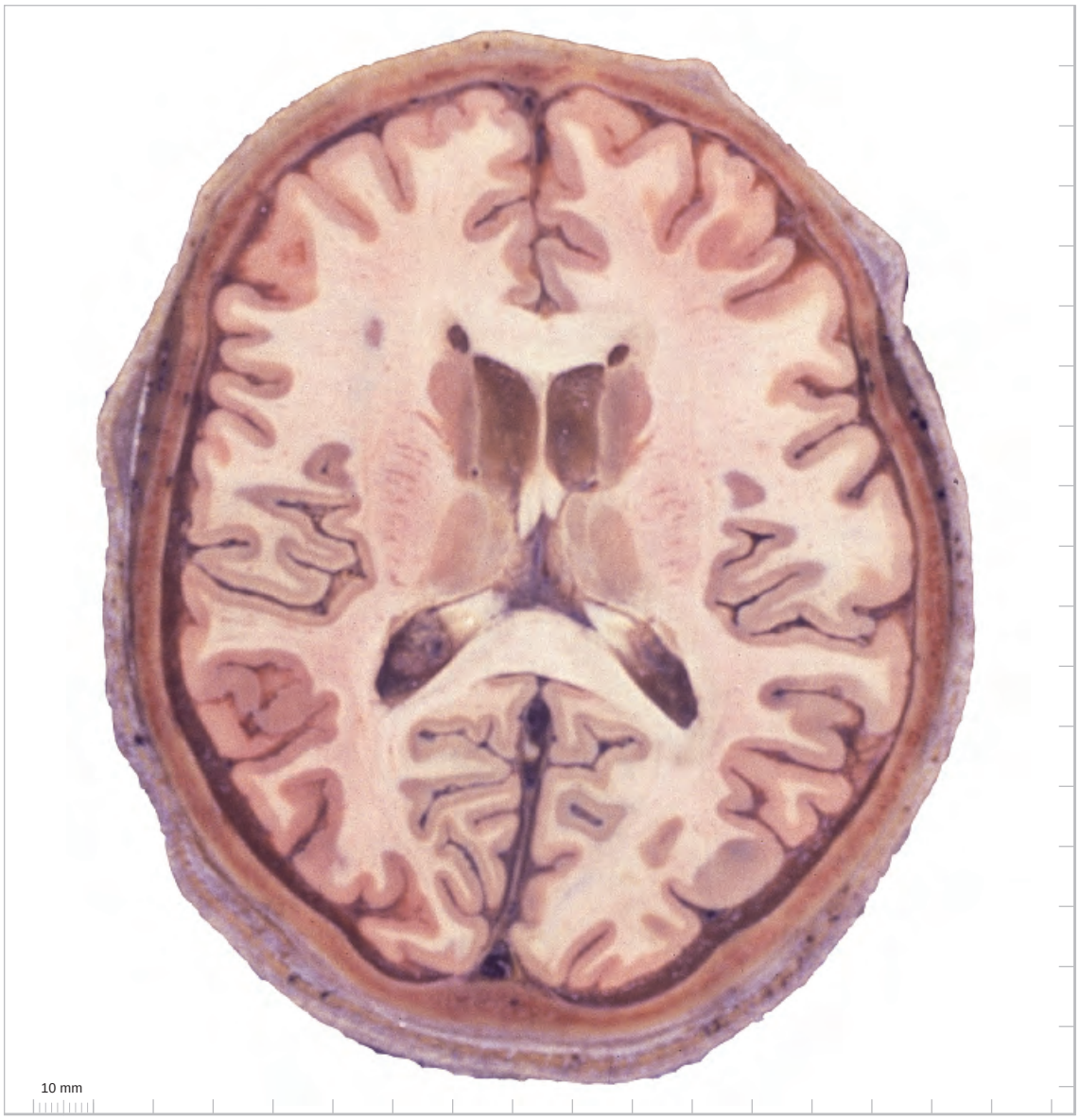


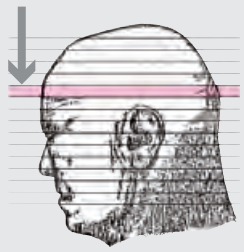






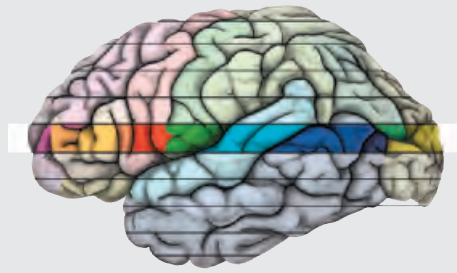


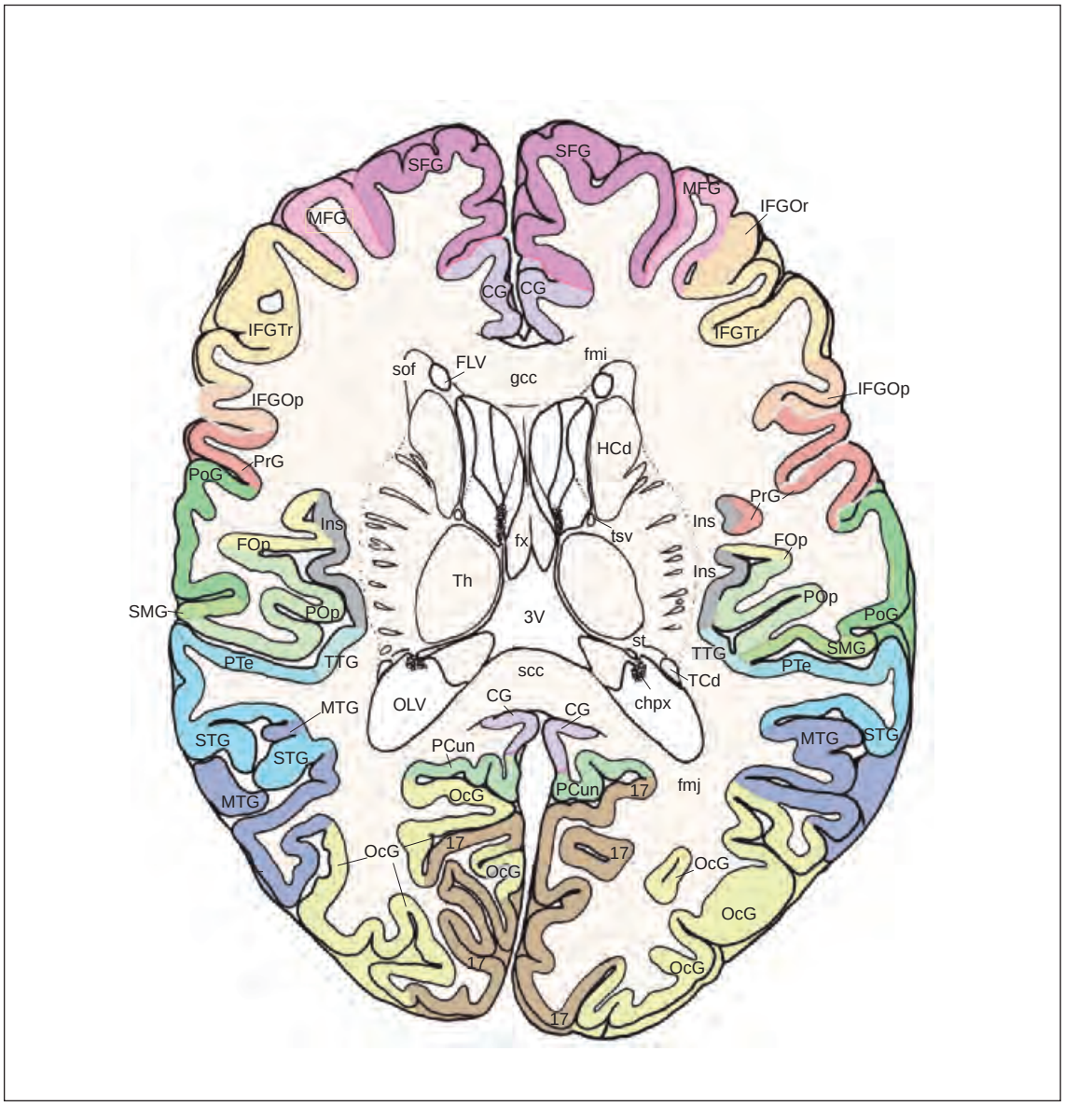




6

(dorsal view)

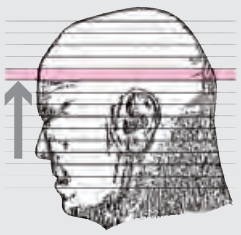


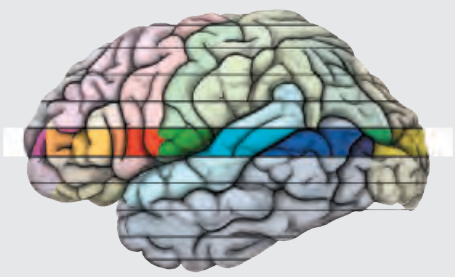


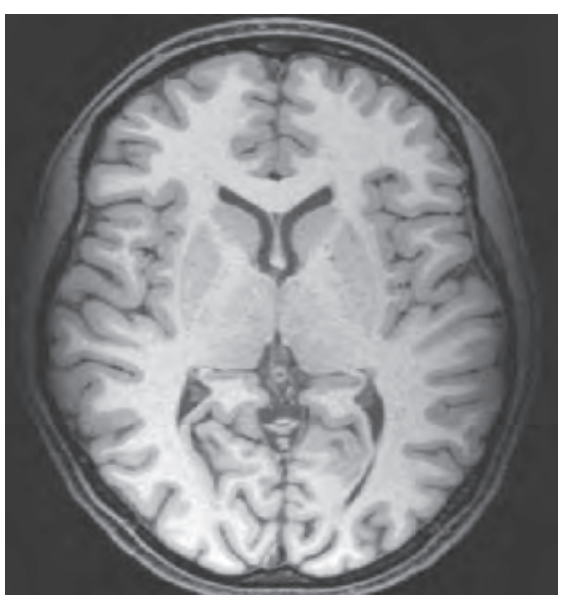
3V	third ventricle
17	striate area
acer	anterior cerebral artery
CG	cingulate gyrus
chpx	choroid plexus of the lateral ventricle
Cun	cuneus
FLV	frontal horn of lateral ventricle
fmi	forceps minor of the corpus callosum
fmj	forceps major of the corpus callosum
FOp	frontal operculum
fx	fornix
gcc	genu of the corpus callosum
HCd	head of caudate nucleus
IFGOp	inferior frontal gyrus, opercular part
IFGOr	inferior frontal gyrus, orbital part
IFGTr	inferior frontal gyrus, triangular part
Ins	insula
IPL	inferior parietal lobule
LV	lateral ventricle
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
OLV	occipital horn of lateral ventricle
pcer	posterior cerebral artery
PCun	precuneus
PoG	postcentral gyrus
POp	parietal operculum
PrG	precentral gyrus
PTe	planum temporale
scc	splenium of the corpus callosum
SFG	superior frontal gyrus
SMG	supramarginal gyrus
sof	superior occipitofrontal fasciculus
st	stria terminalis
STG	superior temporal gyrus
TCd	tail of caudate nucleus
Th	thalamus
tsv	thalamostriate vein
TTG	transverse temporal gyrus

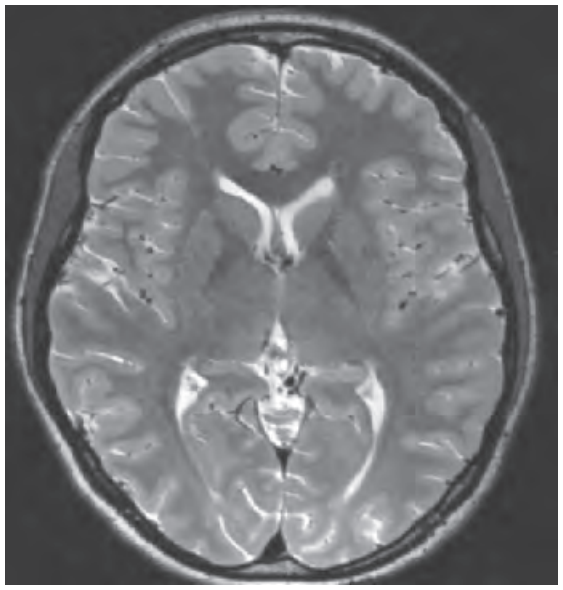
6

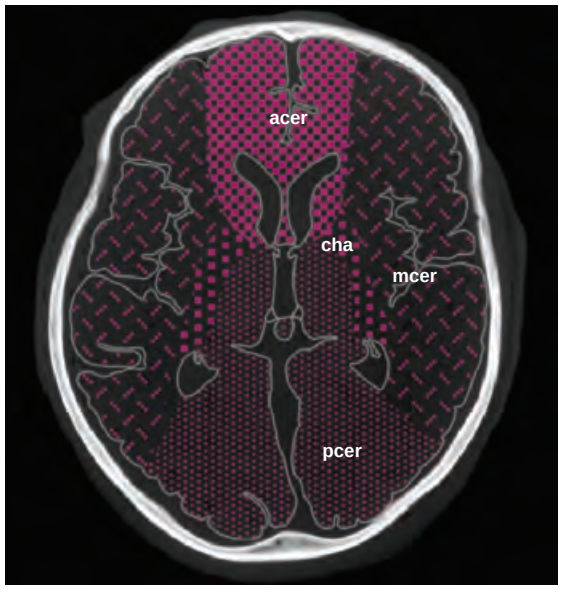
(ventral view)

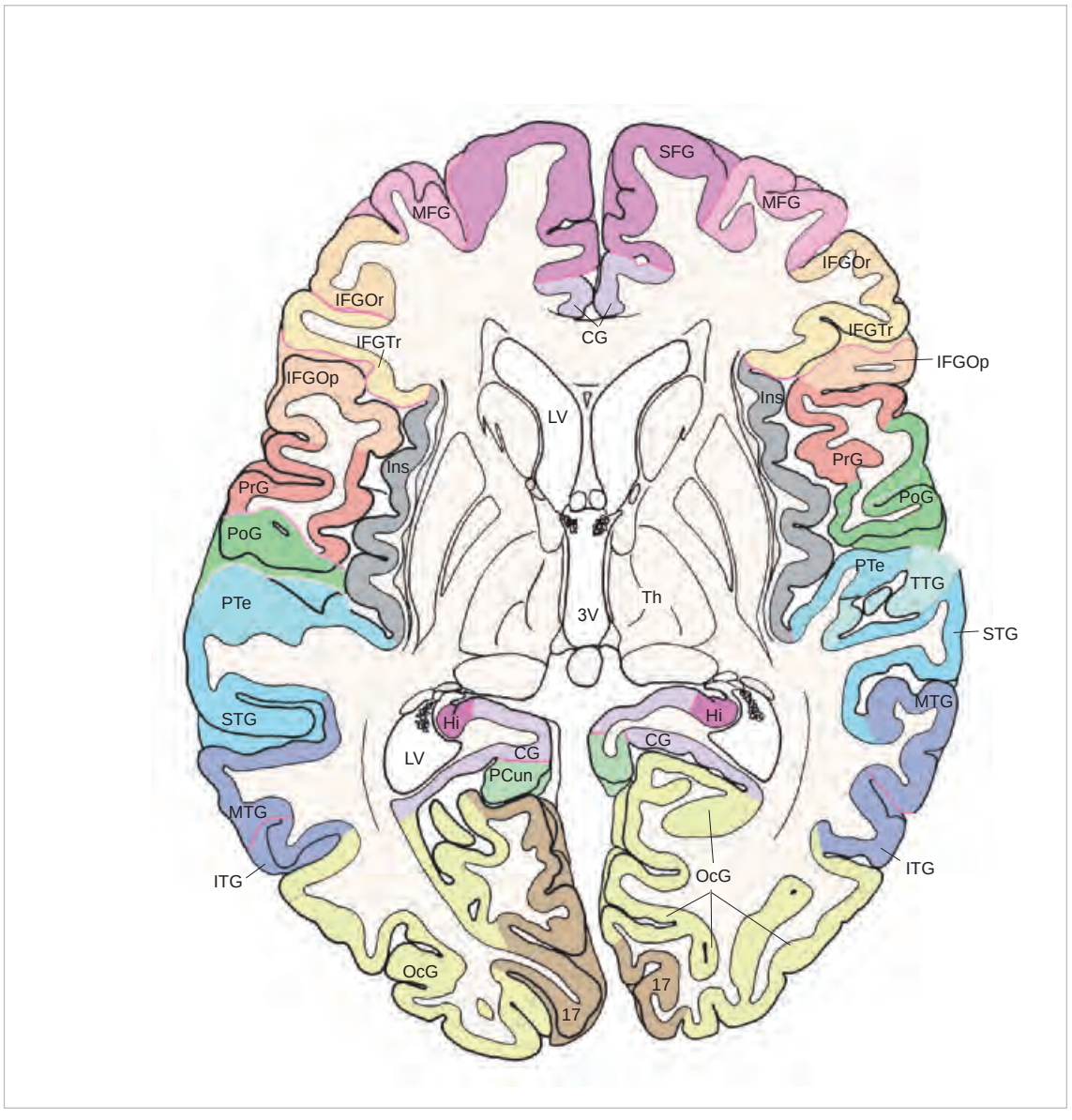


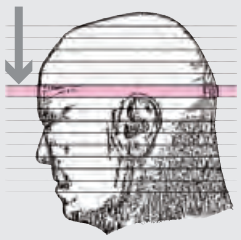






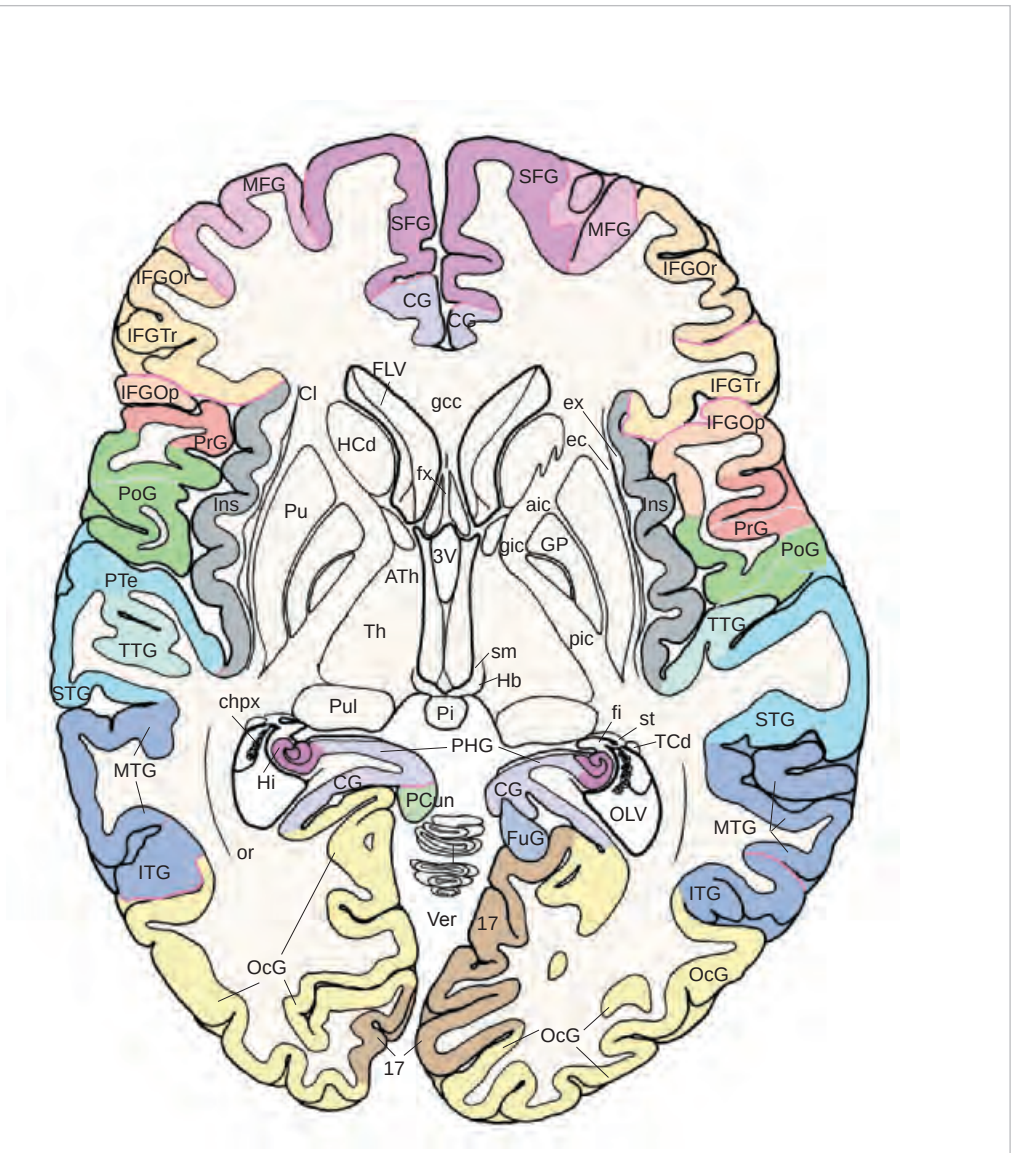






7

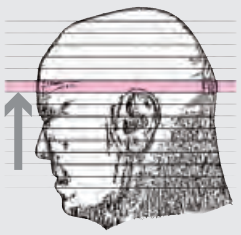
(dorsal view)

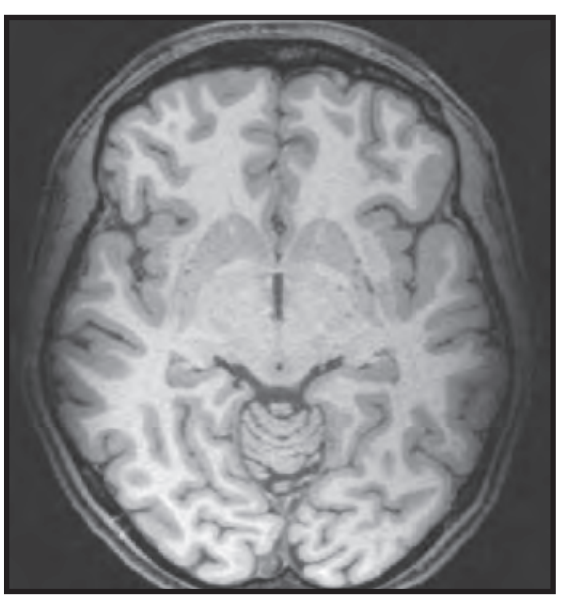


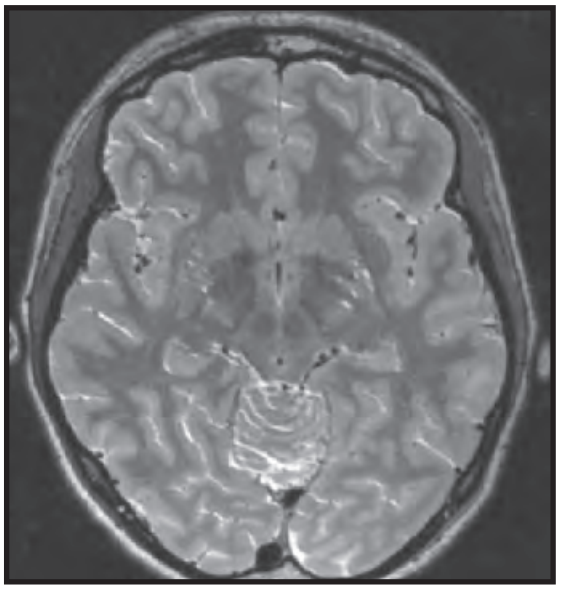
3V	third ventricle
17	striate area
acer	anterior cerebral artery
aic	anterior limb of the internal capsule
ATh	anterior thalamic nucleus
CG	cingulate gyrus
cha	anterior choroidal artery
chpx	choroid plexus of the lateral ventricle
Cl	claustrum
ec	external capsule
ex	extreme capsule
fi	fimbria of the hippocampus
FLV	frontal horn of lateral ventricle
FuG	fusiform gyrus
fx	fornix
gcc	genu of the corpus callosum
gic	internal capsule, genu
GP	globus pallidus
Hb	habenula
HCd	head of caudate nucleus
Hi	hippocampus
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
IFGOr	inferior frontal gyrus, orbital part
IFGTr	inferior frontal gyrus, triangular part
Ins	insula
ITG	inferior temporal gyrus
LV	lateral ventricle
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
OLV	occipital horn of lateral ventricle
or	optic radiation
pcer	posterior cerebral artery
PCun	precuneus
PHG	parahippocampal gyrus
Pi	pineal gland
pic	posterior limb of the internal capsule
PoG	postcentral gyrus
PrG	precentral gyrus
PTe	planum temporale
Pu	putamen
Pul	pulvinar thalami
SFG	superior frontal gyrus
sm	stria medullaris of thalamus
st	stria terminalis
STG	superior temporal gyrus
TCd	tail of caudate nucleus
Th	thalamus
TTG	transverse temporal gyrus
Ver	vermis of cerebellum

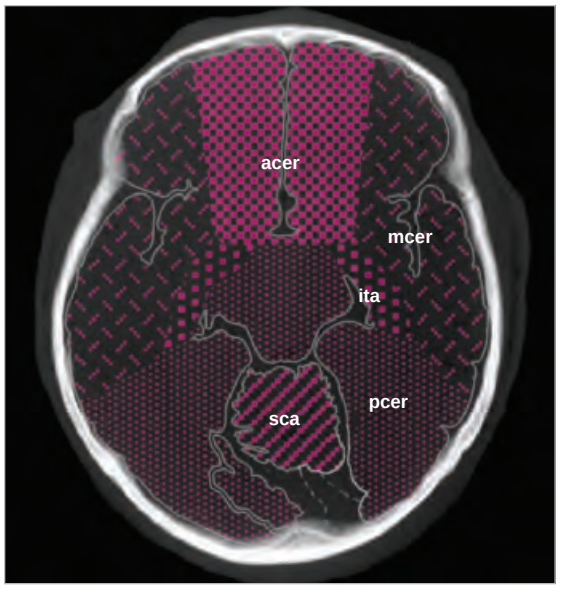
7

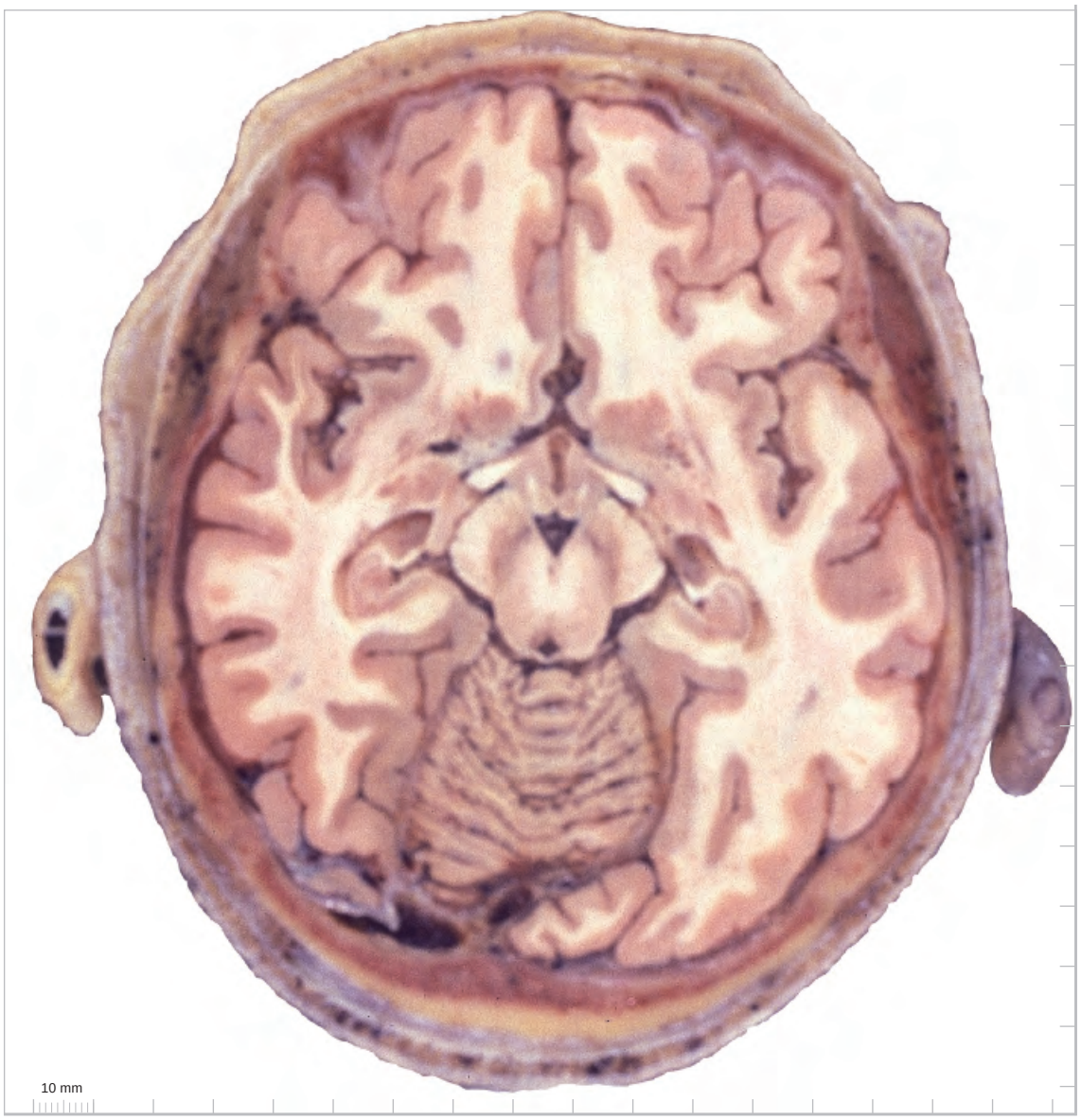
(ventral view)

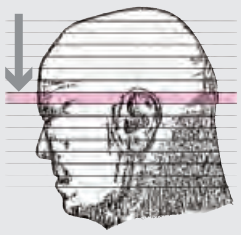






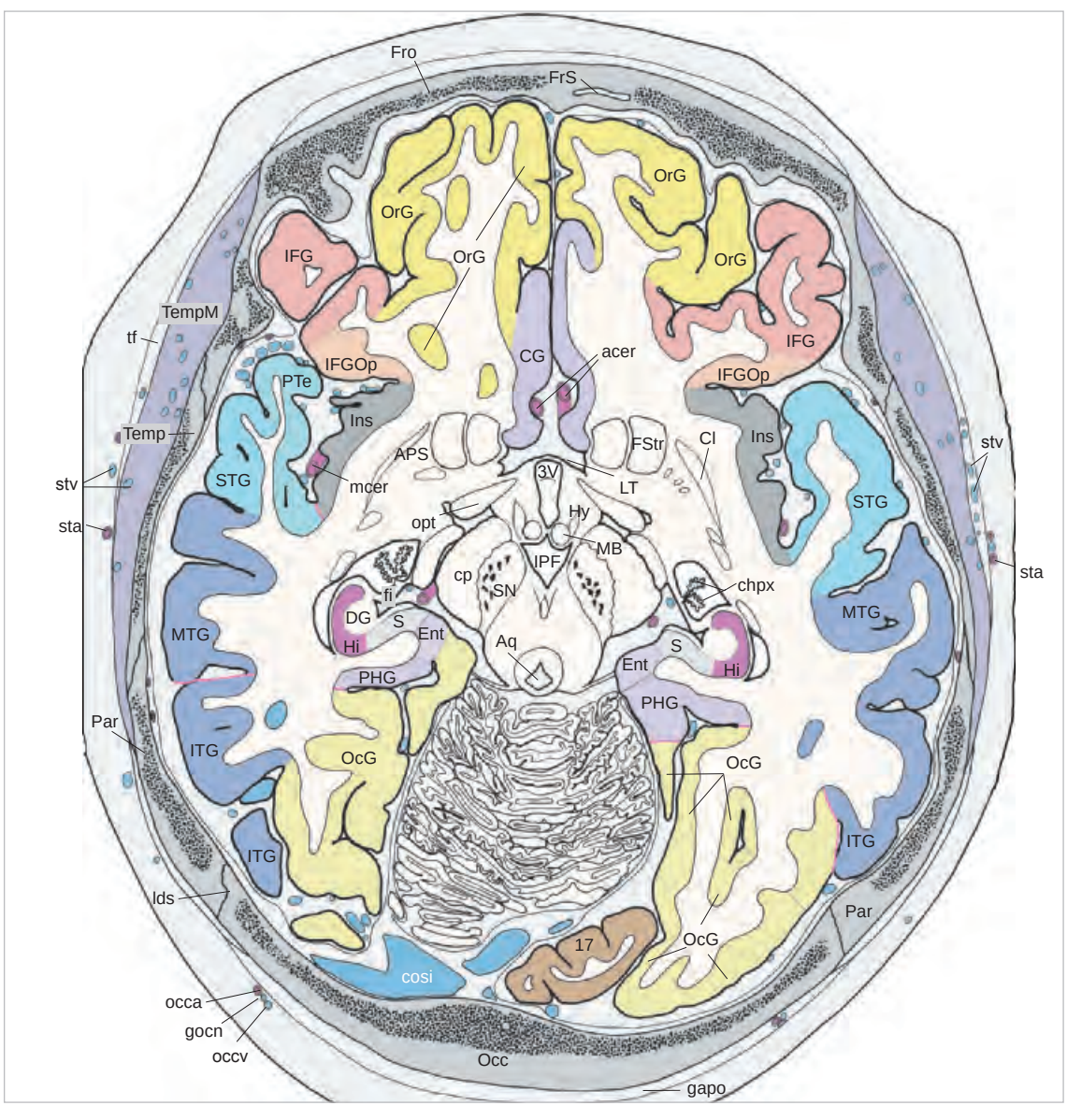






8

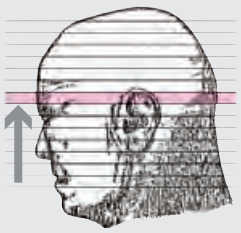
(dorsal view)

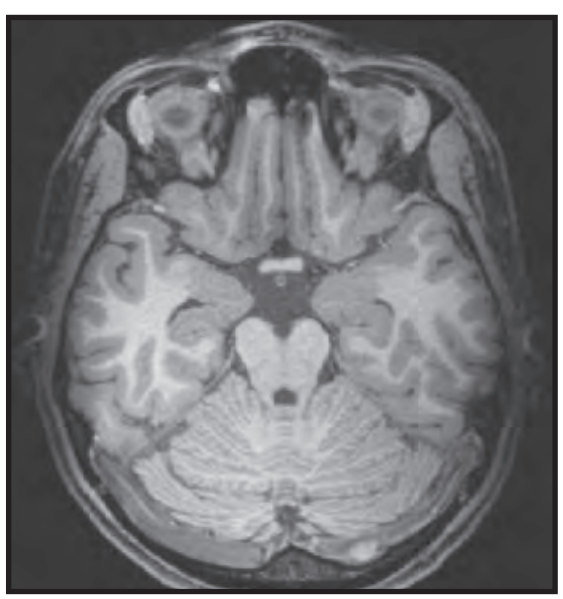


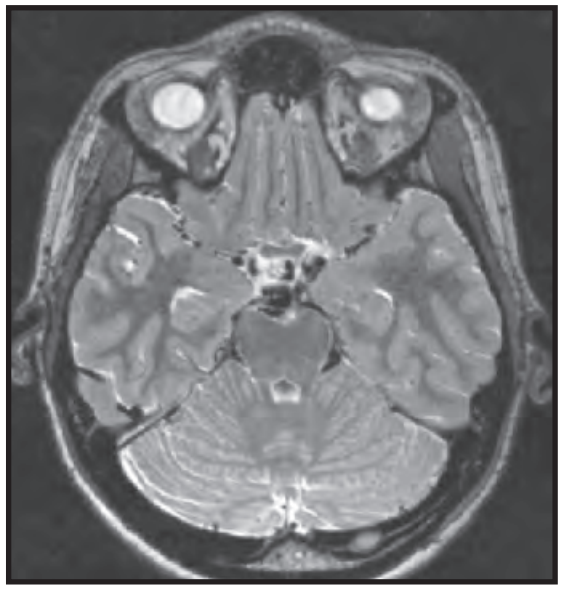
3V	third ventricle
17	striate area
acer	anterior cerebral artery
APS	anterior perforated substance
Aq	cerebral aqueduct
CG	cingulate gyrus
chpx	choroid plexus of the lateral ventricle
Cl	claustrum
cosi	confluence of sinuses
cp	cerebral peduncle
DG	dentate gyrus
Ent	entorhinal cortex
fi	fimbria of hippocampus
Fro	frontal bone
FrS	frontal sinus
FStr	fundus striati
gapo	galea aponeurotica (epicranial aponeurosis)
gocn	greater occipital nerve
Hi	hippocampus
Hy	hypothalamus
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
Ins	insula
IPF	interpeduncular fossa
ita	inferior temporal artery
ITG	inferior temporal gyrus
lds	lambdoid suture
LT	lamina terminalis
LV	lateral ventricle
MB	mammillary body
mcer	middle cerebral artery
MTG	middle temporal gyrus
Occ	occipital bone
occa	occipital artery
occv	occipital vein
OcG	occipital gyri
opt	optic tract
OrG	orbital gyri
Par	parietal bone
pcer	posterior cerebral artery
PHG	parahippocampal gyrus
PTe	planum temporale
R	red nucleus
S	subiculum
sca	superior cerebellar artery
SN	substantia nigra
sta	superficial temporal artery
STG	superior temporal gyrus
stv	superficial temporal vein
Temp	temporal bone
TempM	temporalis muscle
tf	temporal fascia

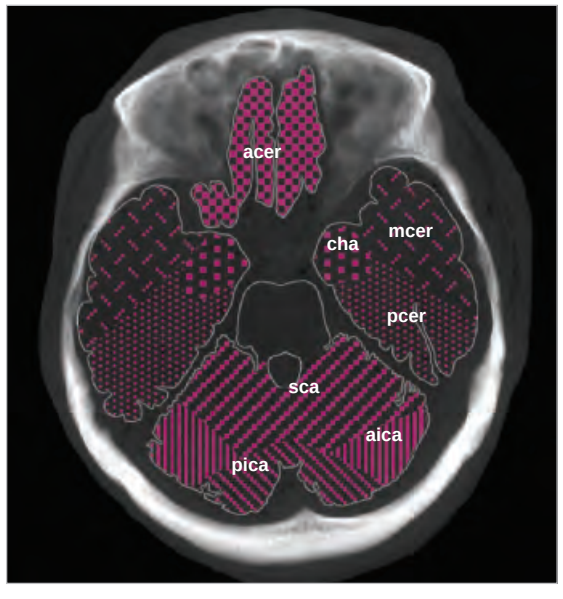
8

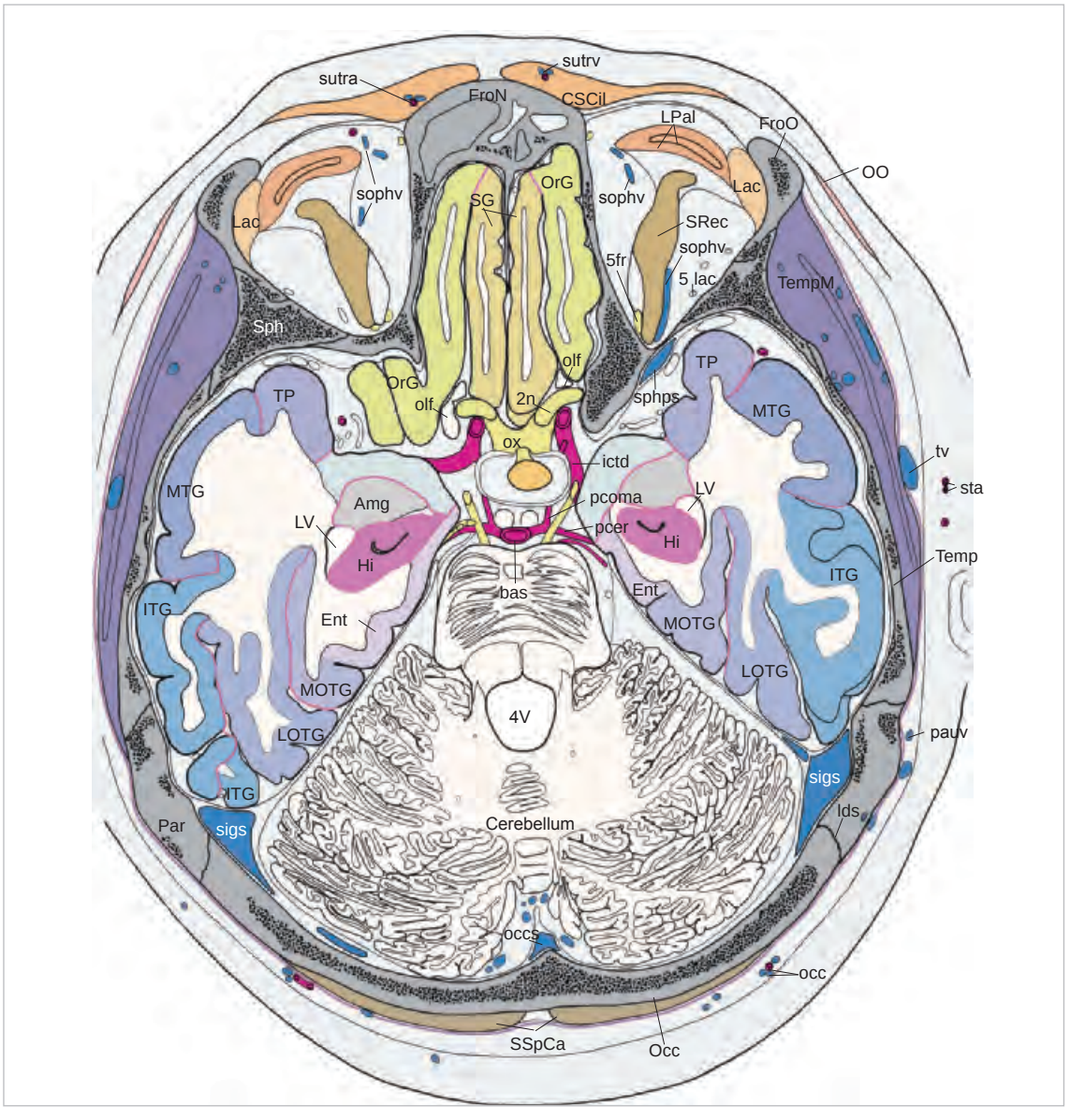
(ventral view)

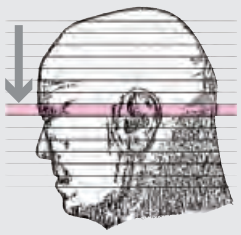






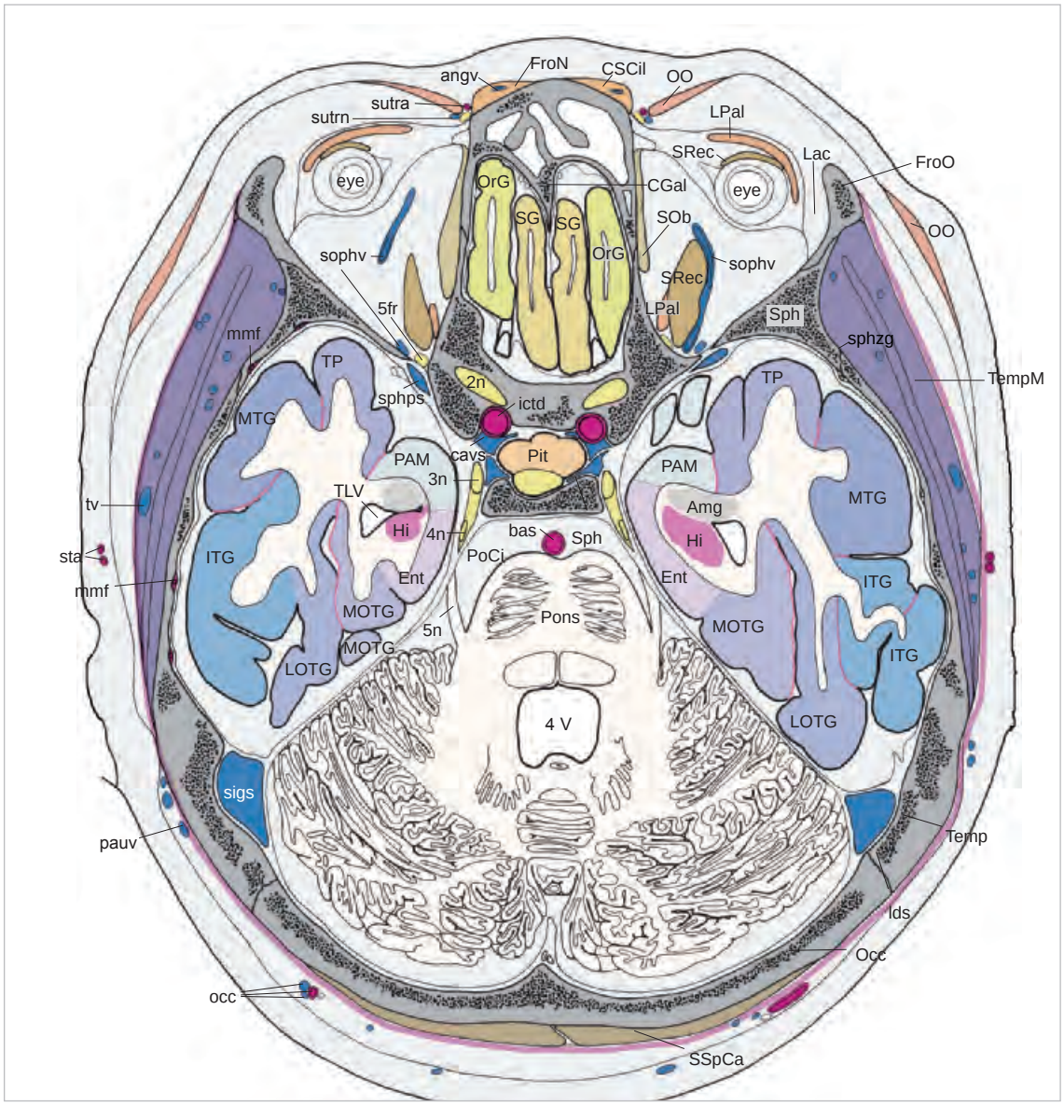






9

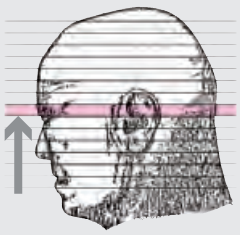
(dorsal view)

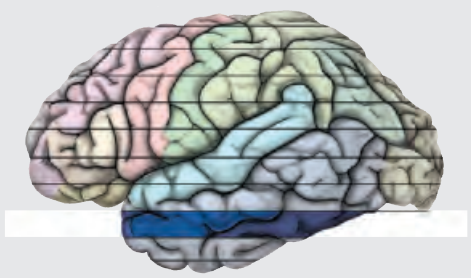


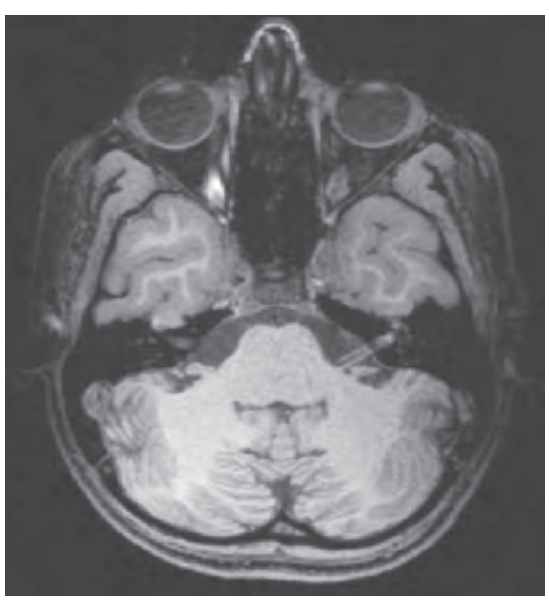
2n	optic nerve
3n	oculomotor nerve
4n	trochlear nerve
4V	fourth ventricle
5fr	frontal nerve
5lac	lacrimal nerve
5n	trigeminal nerve
acer	anterior cerebral artery
aica	anterior inferior cerebellar artery
Amg	amygdala
angv	angular vein
bas	basilar artery
cavs	cavernous sinus
CGal	crista galli
cha	anterior choroidal artery
PoCi	pontocerebellar cistern
CSCil	corrugator supercilii muscle
Ent	entorhinal cortex
FroN	frontal bone, nasal part
FroO	frontal bone, orbital part
Hi	hippocampus
ictd	internal carotid artery
ITG	inferior temporal gyrus
Lac	lacrimal gland
lds	lambdoid suture
LOTG	lateral occipito-temporal gyrus
LPal	levator palpebrae superioris muscle
LV	lateral ventricle
mcer	middle cerebral artery
mmf	middle meningeal artery, frontal branch
MOTG	medial occipito-temporal gyrus
MTG	middle temporal gyrus
Occ	occipital bone
occ	occipital artery, vein and nerve
occs	occipital sinus
olf	olfactory tract
OO	orbicularis oculi muscle
OrG	orbital gyrus
ox	optic chiasm
PAM	periamygdaloid cortex
Par	parietal bone
pauv	posterior auricular vein
pcer	posterior cerebral artery
pcoma	posterior communicating artery
pica	posterior inferior cerebellar artery
Pit	pituitary gland
PoCi	pontine cistern
Pons	pons
sca	superior cerebellar artery
SG	straight gyrus
sigs	sigmoid sinus
SOb	superior oblique muscle
sophv	superior ophthalmic vein
Sph	sphenoid bone
sphps	sphenoparietal sinus
sphzg	sphenozygomatic suture
SRec	superior rectus muscle
SSpCa	semispinalis capitis muscle
sta	superficial temporal artery
sutra	supratrochlear artery
sutrn	supratrochlear nerve
sutrv	supratrochlear vein
Temp	temporal bone
TempM	temporalis muscle
TLV	temporal horn of lateral ventricle
TP	temporal pole
tv	temporal vein

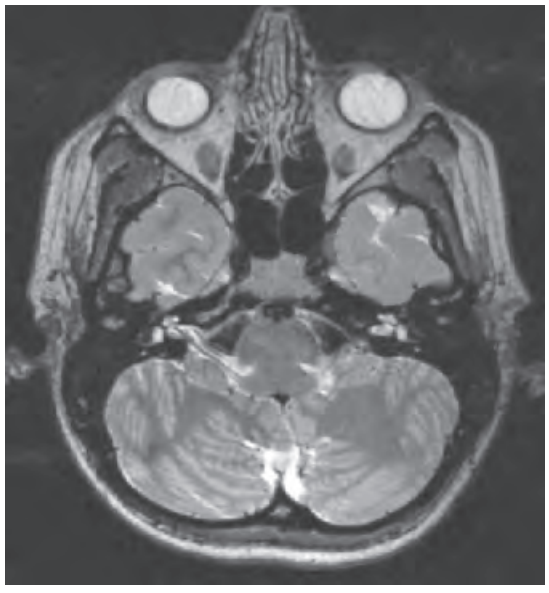
9

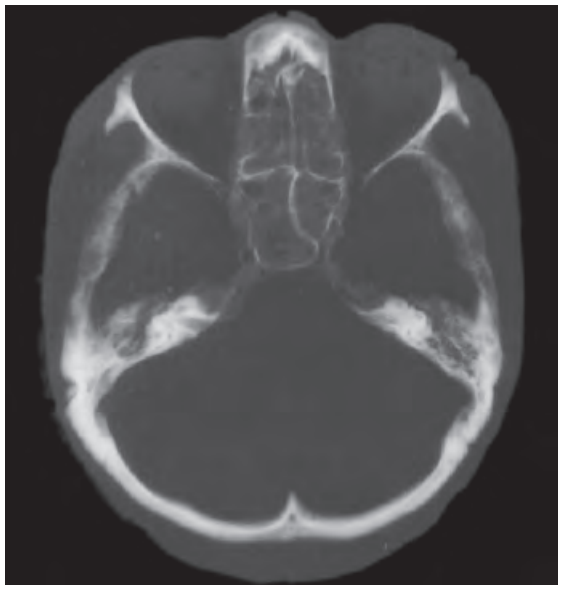
(ventral view)

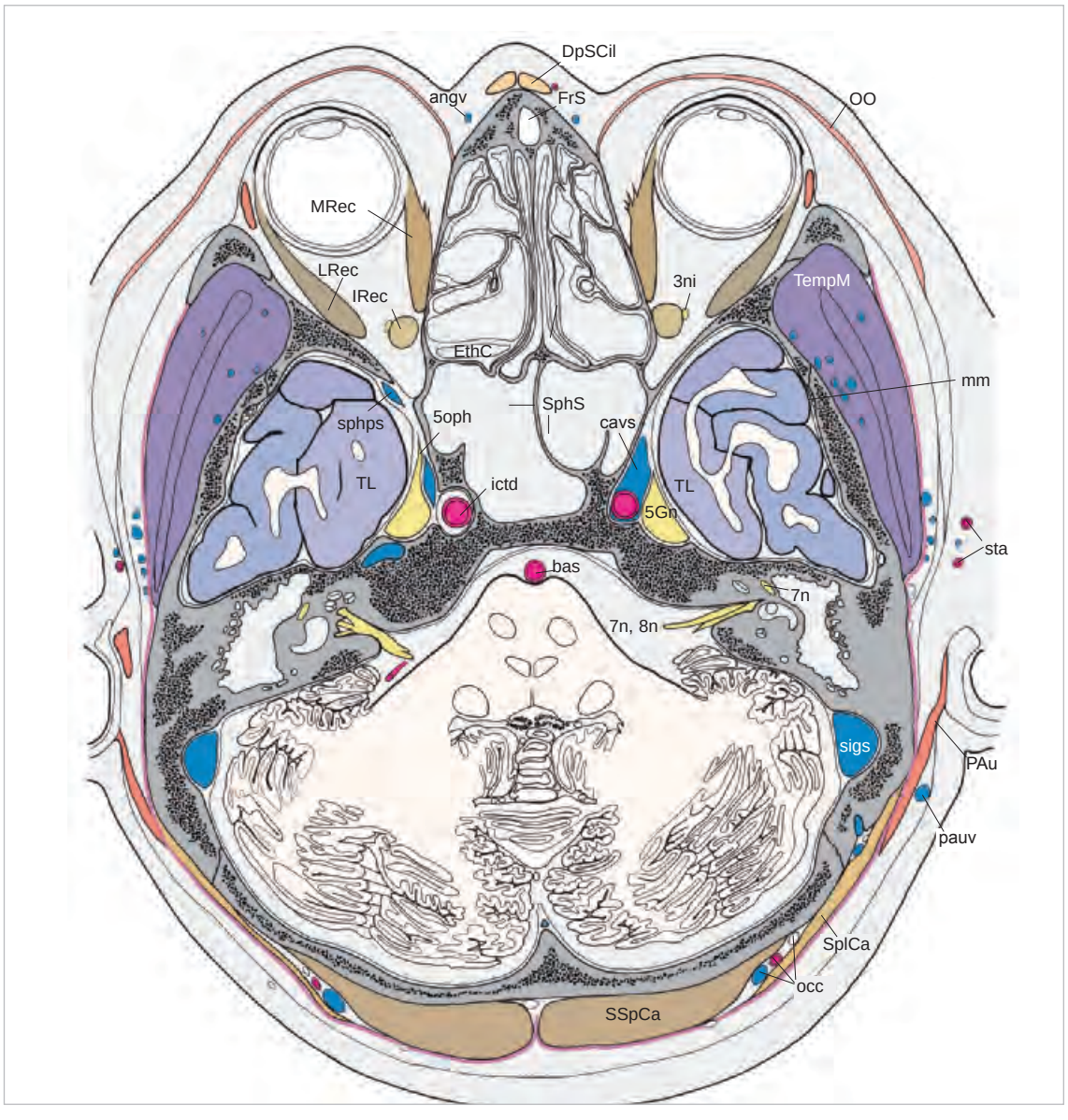


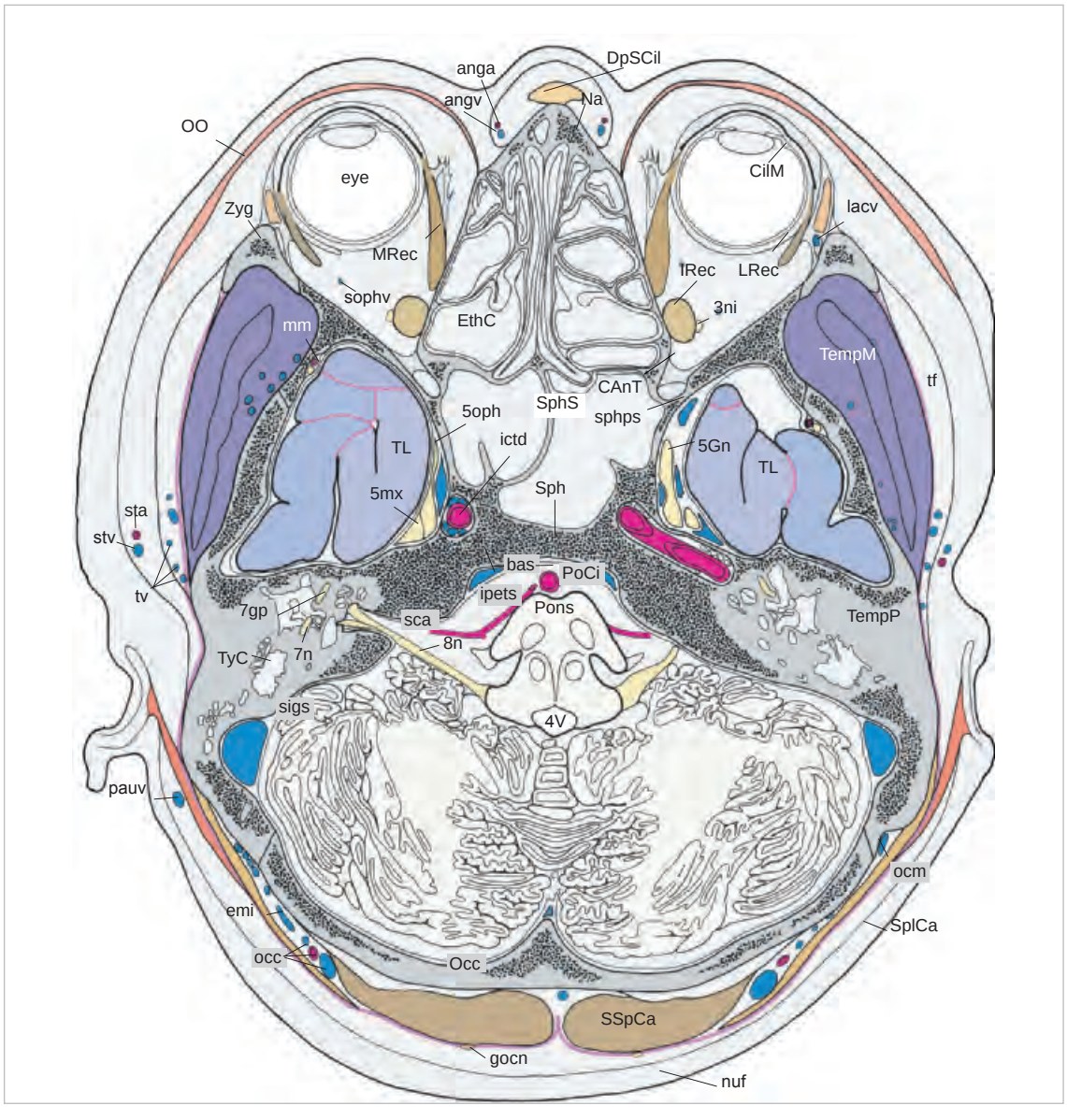


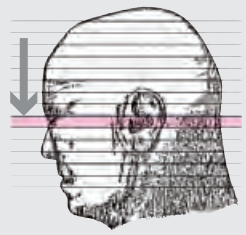












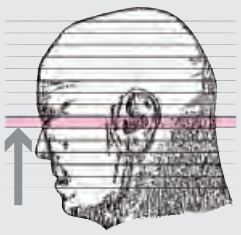
10

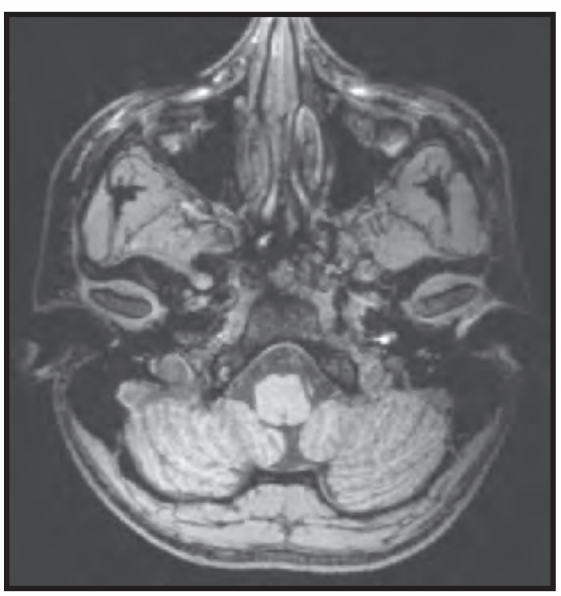
(dorsal view)

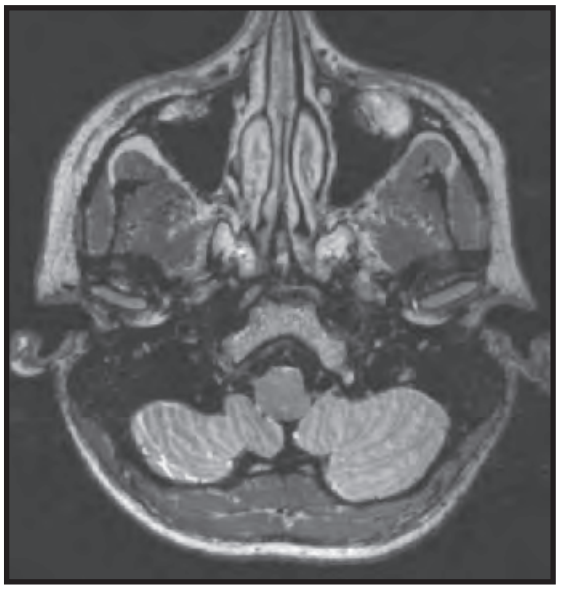
3ni	oculomotor nerve (inferior branch)
4V	fourth ventricle
5Gn	trigeminal ganglion
5mx	maxillary nerve
5oph	ophthalmic nerve
7gp	greater petrosal nerve
7n	facial nerve
8n	vestibulocochlear nerve
anga	angular artery
angv	angular vein
bas	basilar artery
CAnT	common anular tendon
cavs	cavernous sinus
CilM	ciliaris muscle
DpSCil	depressor supercilii muscle
emi	emissary vein
EthC	ethmoidal cell
eye	eyeball
FrS	frontal sinus
gocn	greater occipital nerve
ictd	internal carotid artery
ipets	inferior petrosal sinus
IRec	inferior rectus muscle
lacv	lacrimal vein
LRec	lateral rectus muscle
mm	middle meningeal artery
MRec	medial rectus muscle
Na	nasal bone
nuf	nuchal fascia
Occ	occipital bone
occ	occipital artery, vein and nerve
ocm	occipito-mastoid suture
OO	orbicularis oculi muscle
PAu	posterior auricular muscle
pauv	posterior auricular vein
PoCi	pontine cistern
sca	superior cerebellar artery
sigs	sigmoid sinus
sophv	superior ophthalmic vein
Sph	sphenoid bone
sphps	sphenoparietal sinus
SphS	sphenoid sinus
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
sta	superficial temporal artery
stv	superficial temporal vein
TempM	temporalis muscle
TempP	temporal bone, petrosal part
tf	temporal fascia
TL	temporal lobe
tv	temporal veins
TyC	tympanic cavity
Zyg	zygomatic bone

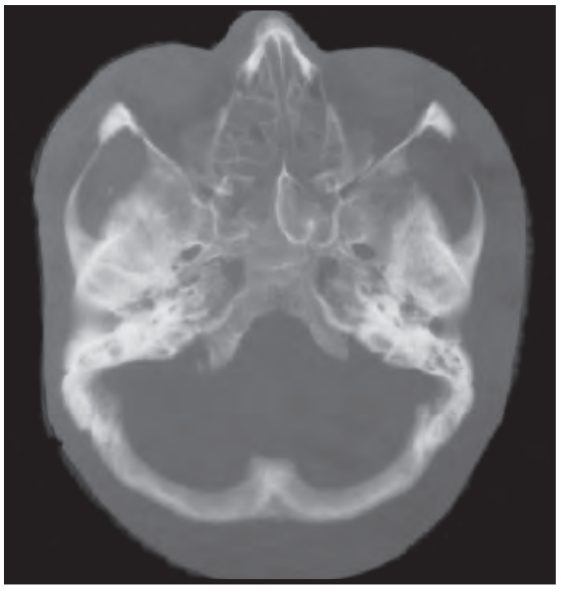
10

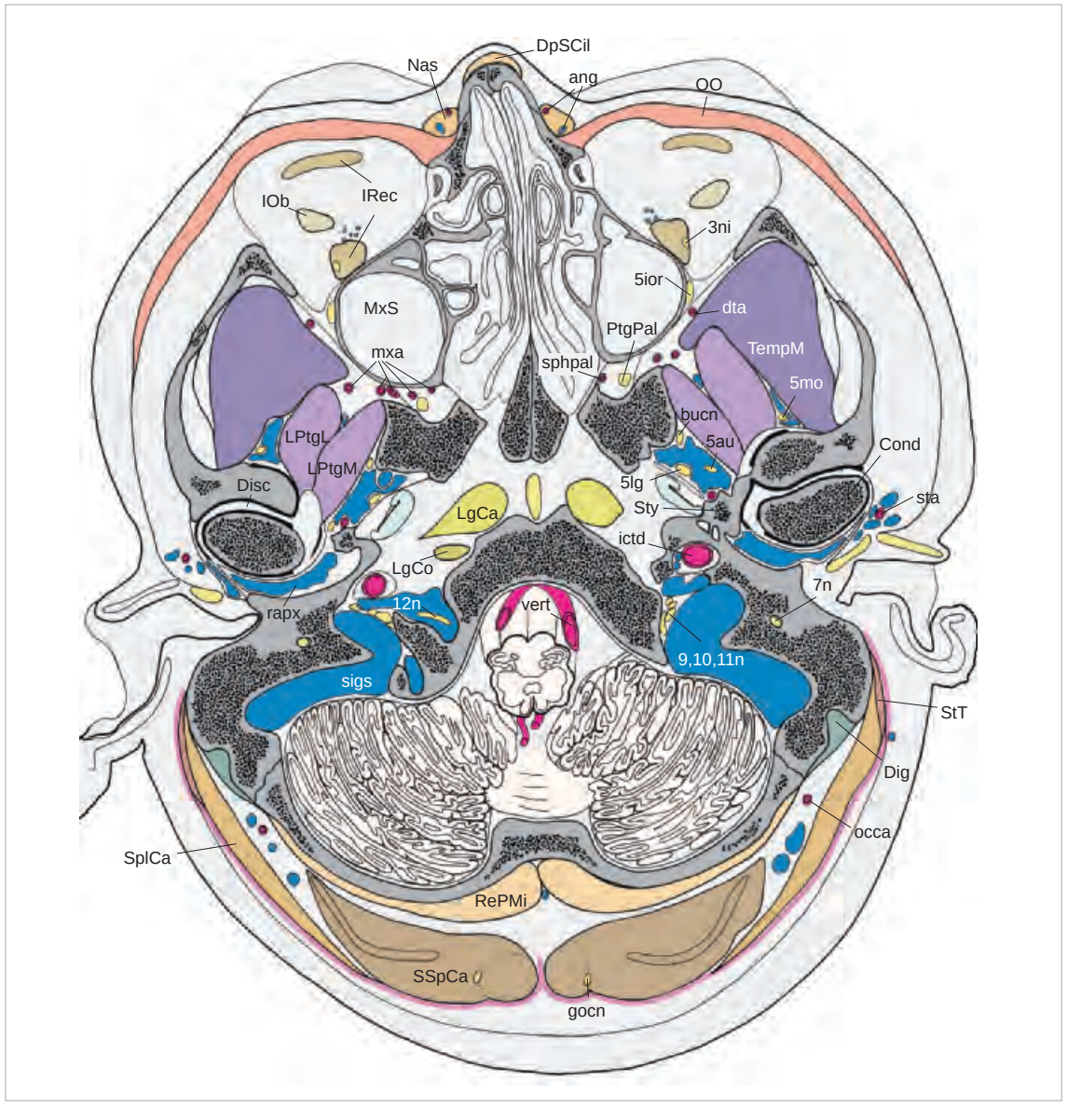
(ventral view)

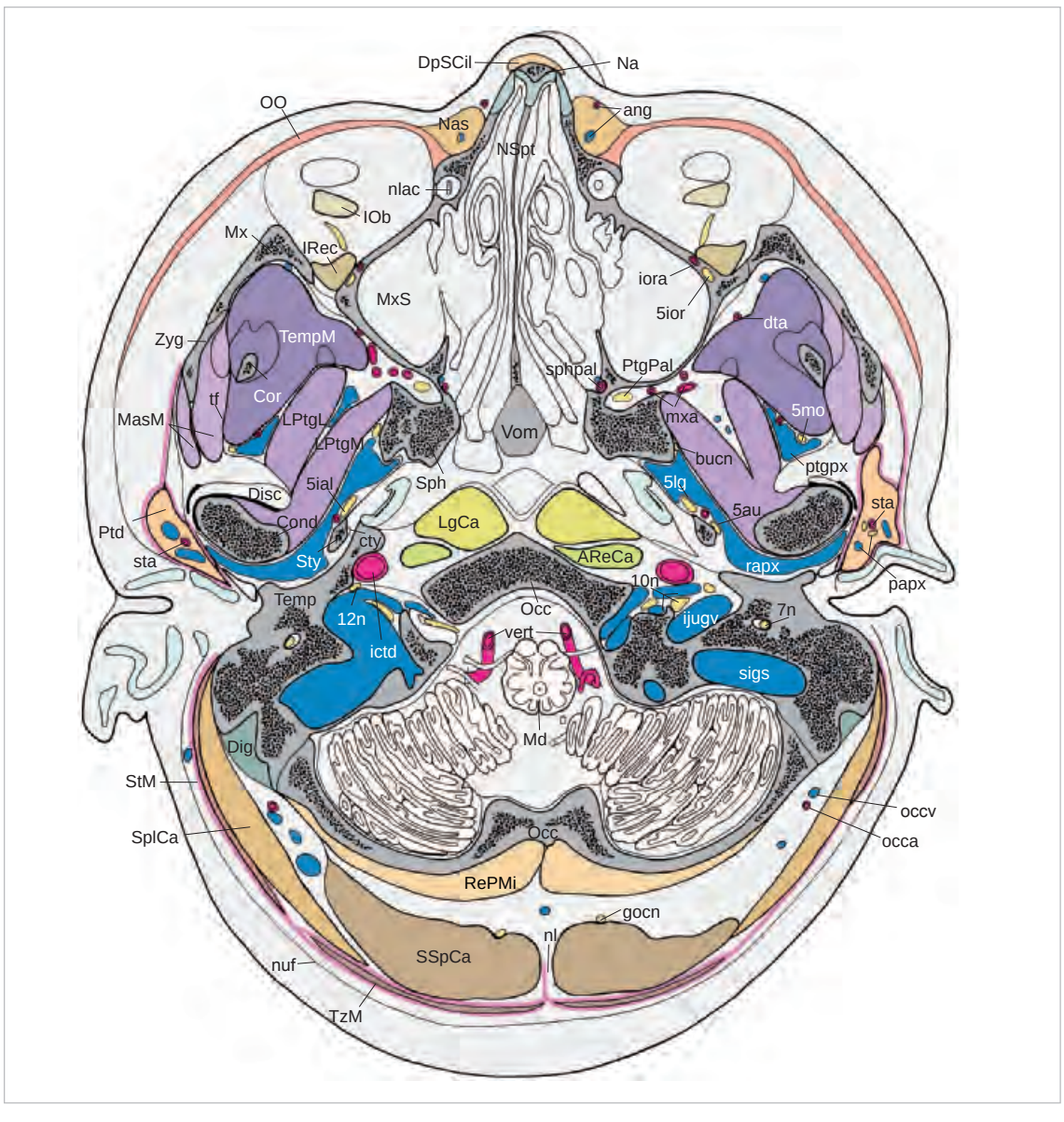


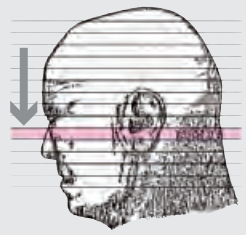












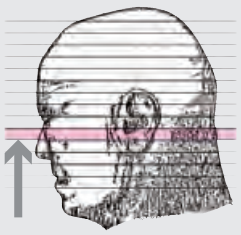
11

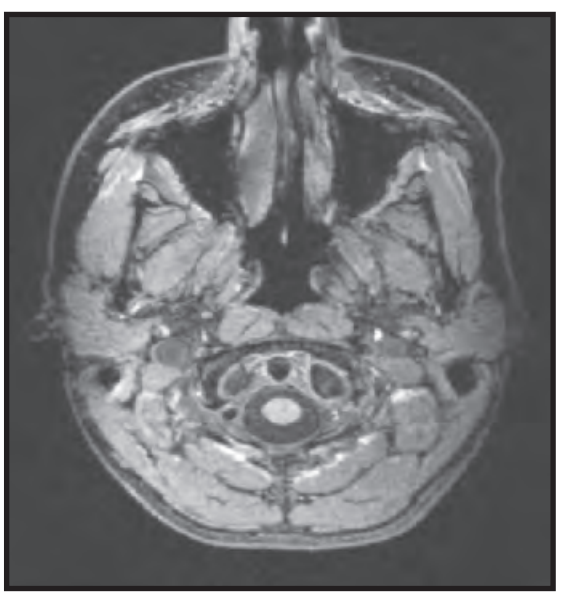
(dorsal view)

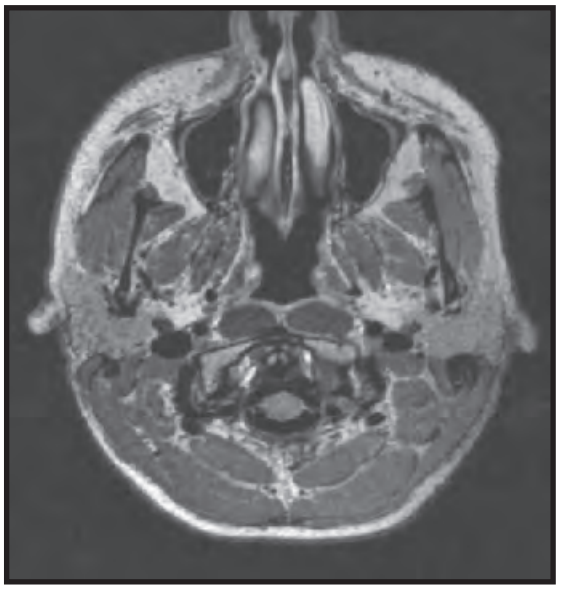
3ni	oculomotor nerve (inferior branch)
5au	auriculotemporal nerve
5ial	inferior alveolar nerve
5ior	infraorbital nerve
5lg	lingual nerve
5mo	motor root of trigeminal nerve
7n	facial nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
ang	angular artery and vein
AReCa	anterior rectus capitis muscle
bucn	buccal nerve
Cond	condylar process of mandible
Cor	coronoid process of the mandible
cty	chorda tympani
Dig	digastric muscle
Disc	articular disc of temporo-mandibular joint
DpSCil	depressor supercilii muscle
dta	deep temporal artery
gocn	greater occipital nerve
ictd	internal carotid artery
ijugv	internal jugular vein
IOb	inferior oblique muscle
iora	infraorbital artery
IRec	inferior rectus muscle
LgCa	longus capitis muscle
LgCo	longus colli muscle
LPtgL	lateral pterygoid muscle, lateral belly
LPtgM	lateral pterygoid muscle, medial belly
MasM	masseter muscle
Md	medulla oblongata
Mx	maxilla
mxa	maxillary artery
MxS	maxillary sinus
Na	nasal bone
Nas	nasalis muscle
nl	nuchal ligament
nlac	nasolacrimal duct
NSpt	nasal septum
nuf	nuchal fascia
Occ	occipital bone
occa	occipital artery
occv	occipital vein
OO	orbicularis oculi muscle
papx	parotid plexus
Ptd	parotid gland
PtgPal	pterygopalatine ganglion
ptgpx	pterygoid plexus
rapx	retroarticular (venous) plexus
RePMi	rectus capitis posterior minor
sigs	sigmoid sinus
Sph	sphenoid bone
sphpal	sphenopalatine artery
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
sta	superficial temporal artery
StM	sternomastoid muscle
StT	sternomastoid muscle, tendon
Sty	styloid process
Temp	temporal bone
TempM	temporalis muscle
tf	temporal fascia
TzM	trapezius muscle
vert	vertebral artery
Vom	vomer
Zyg	zygomatic bone

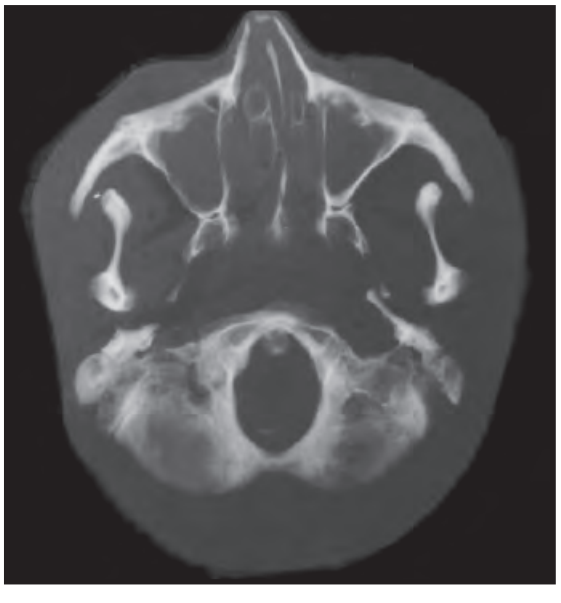
11

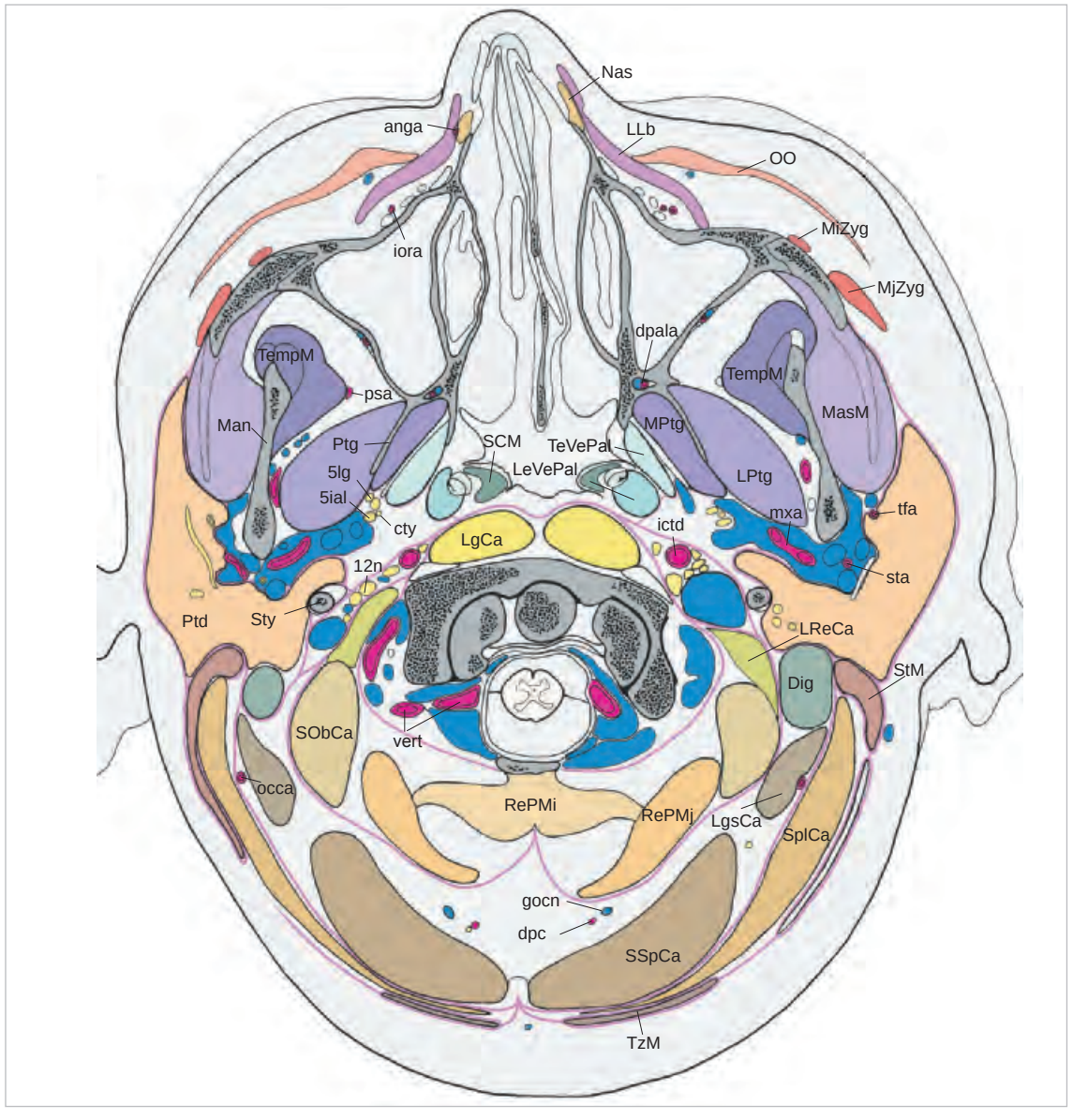
(ventral view)

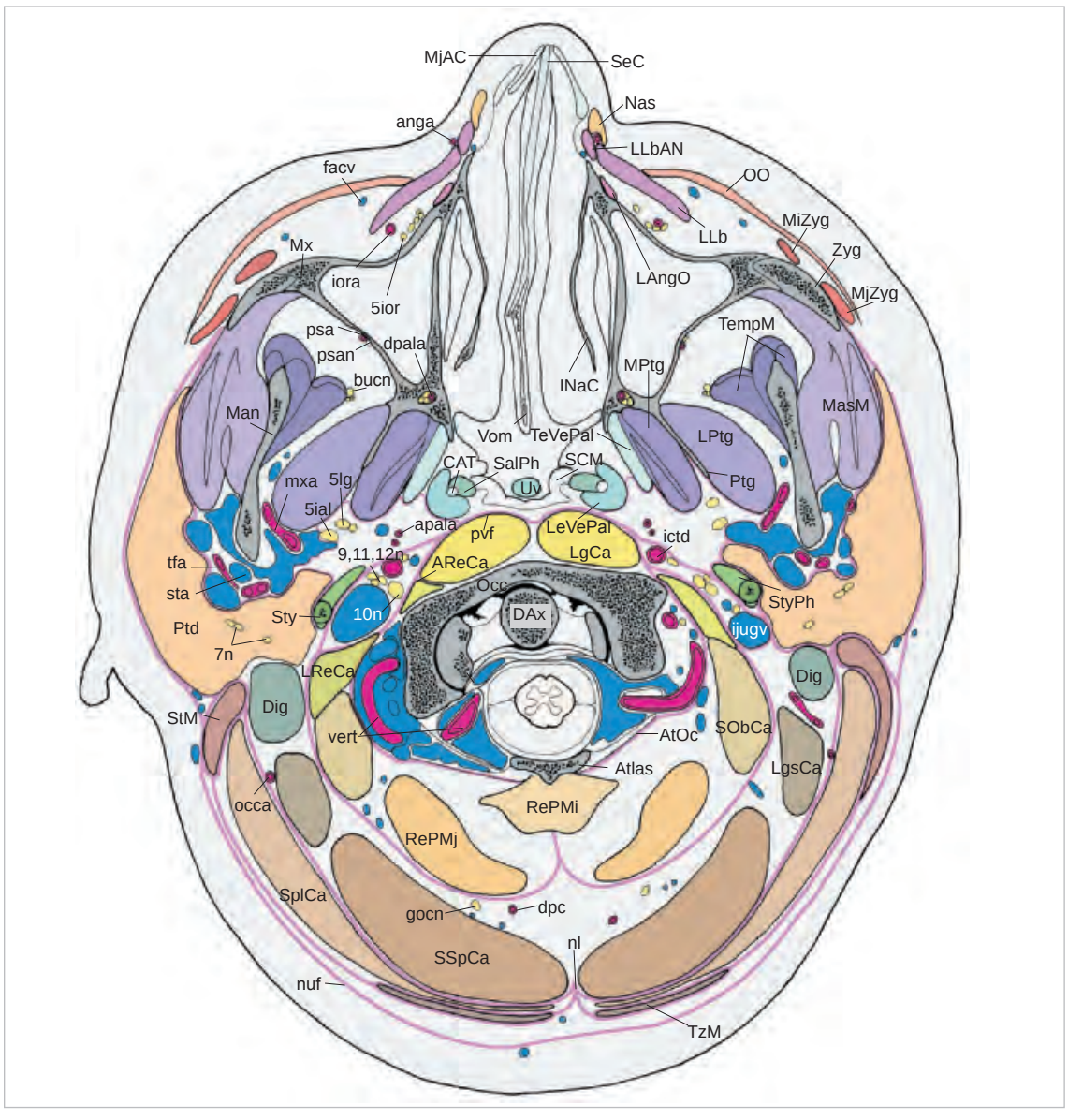


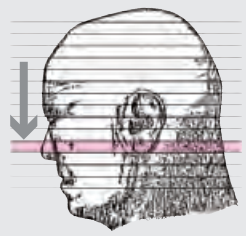












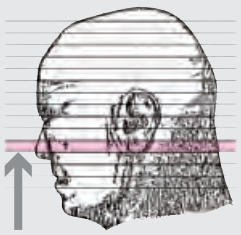
12

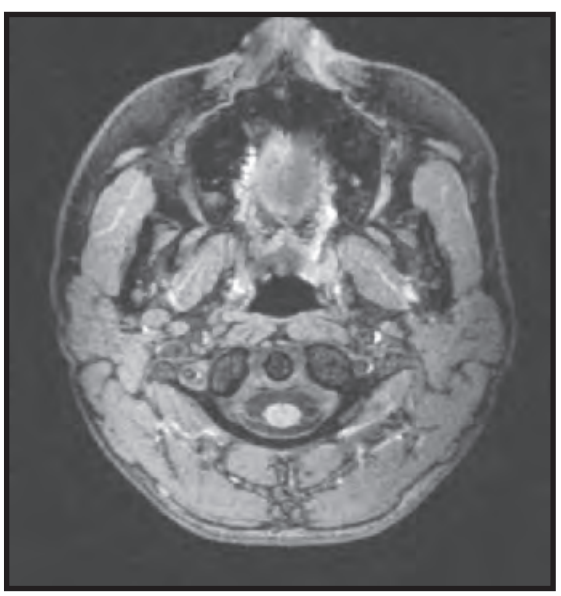
(dorsal view)

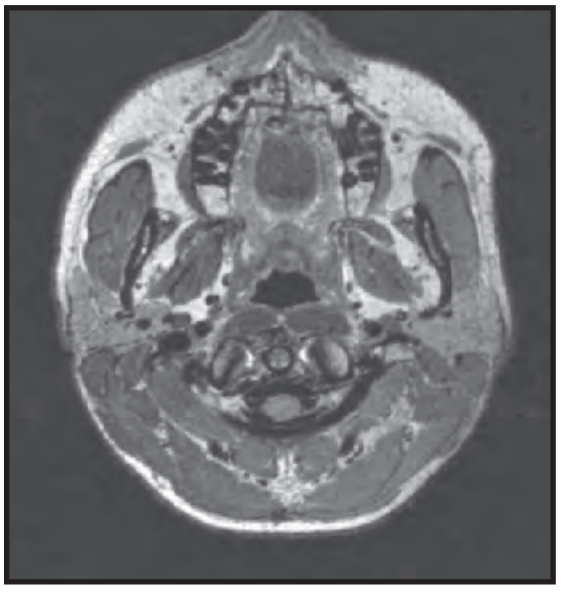
5ial	inferior alveolar nerve
5ior	infraorbital nerve
5lg	lingual nerve
7n	facial nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
anga	angular artery
apala	ascending palatine artery
AReCa	anterior rectus capitis muscle
Atlas	atlas
AtOc	atlanto-occipital joint
bucn	buccal nerve
CAT	cartilage of auditory tube
cty	chorda tympani
DAx	dens axis
Dig	digastric muscle
dpala	descending palatine artery
dpc	deep cervical artery and vein
facv	facial vein
gocn	greater occipital nerve
ictd	internal carotid artery
ijugv	internal jugular vein
INaC	inferior nasal concha
iora	infraorbital artery
LAngO	levator anguli oris muscle
LeVePal	levator veli palatini muscle
LgCa	longus capitis muscle
LgsCa	longissimus capitis muscle
LLb	levator labii superioris muscle
LLbAN	levator labii superioris alaeque nasi
LPtg	lateral pterygoid muscle
LReCa	lateral rectus capitis muscle
Man	mandible
MasM	masseter muscle
MiZyg	minor zygomaticus muscle
MjAC	major alar cartilage
MjZyg	major zygomaticus muscle
MPtg	medial pterygoid muscle
Mx	maxilla
mxa	maxillary artery
Nas	nasalis muscle
nl	nuchal ligament
nuf	nuchal fascia
Occ	occipital bone
occa	occipital artery
OO	orbicularis oculi muscle
psa	posterior superior alveolar artery
psan	posterior superior alveolar nerve
Ptd	parotid gland
Ptg	pterygoid process
pvf	prevertebral fascia
RePMi	rectus capitis posterior minor muscle
RePMj	rectus capitis posterior major muscle
SalPh	salpingopharyngeus muscle
SCM	superior constrictor of the pharynx
SeC	septal nasal cartilage
SObCa	superior oblique capitis muscle
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
sta	superficial temporal artery
StM	sternomastoid muscle
Sty	styloid process
StyPh	stylopharyngeus muscle
TempM	temporalis muscle
TeVePal	tensor veli palatini muscle
tfa	transverse facial artery
TzM	trapezius muscle
Uv	uvula
vert	vertebral artery
Vom	vomer
Zyg	zygomatic bone

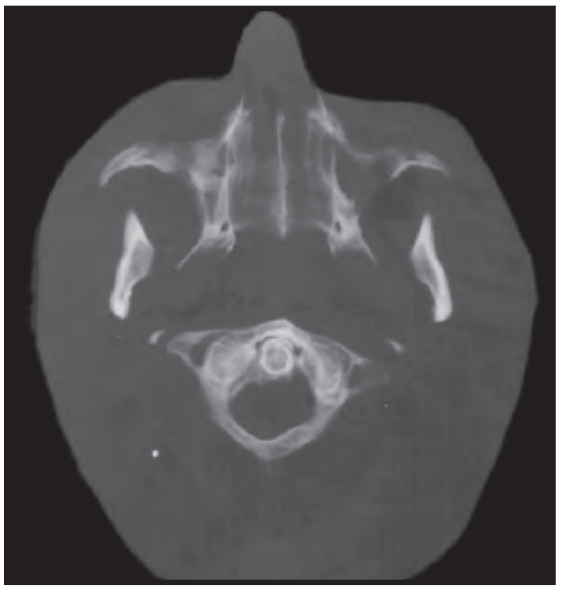
12

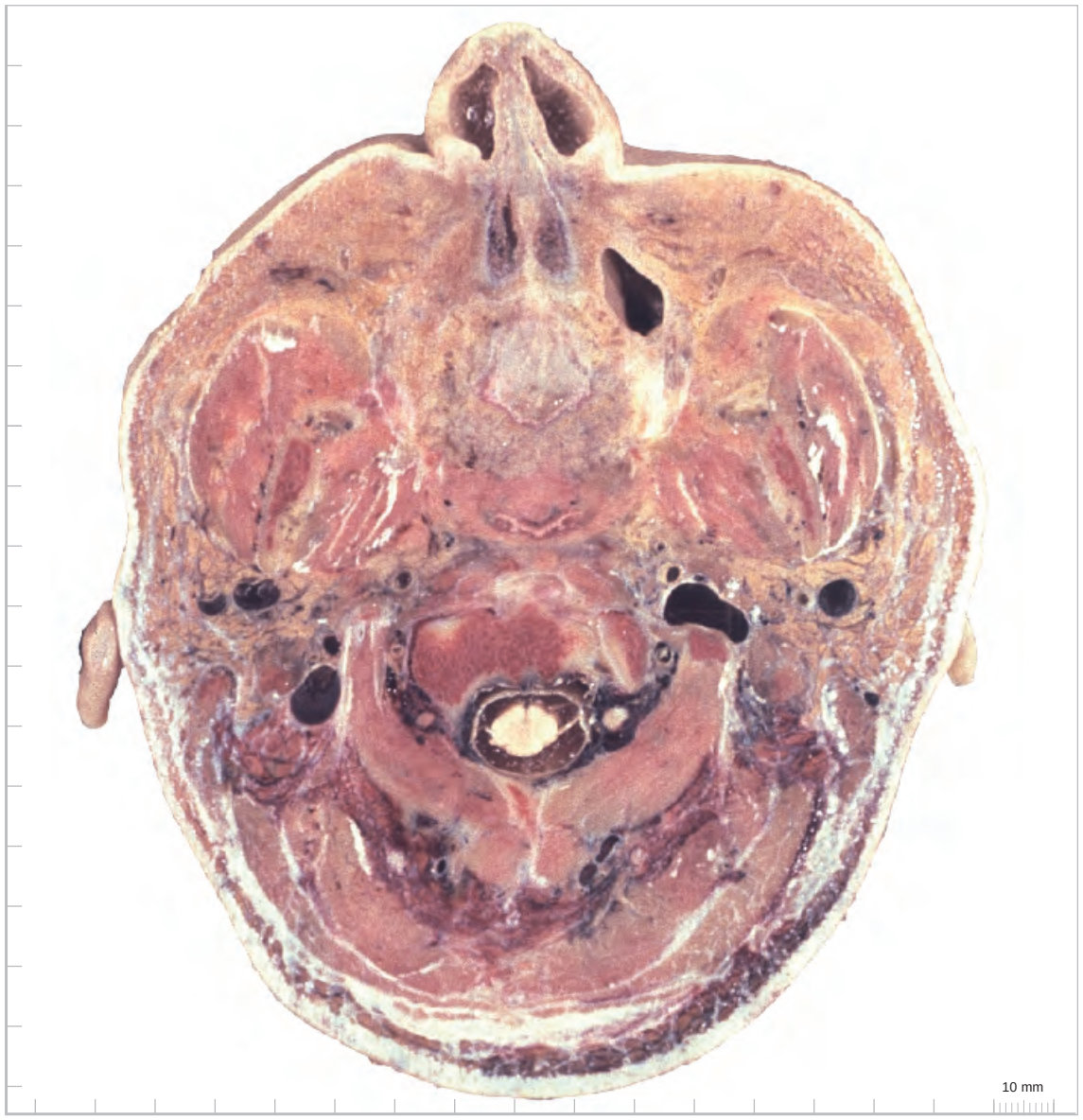
(ventral view)

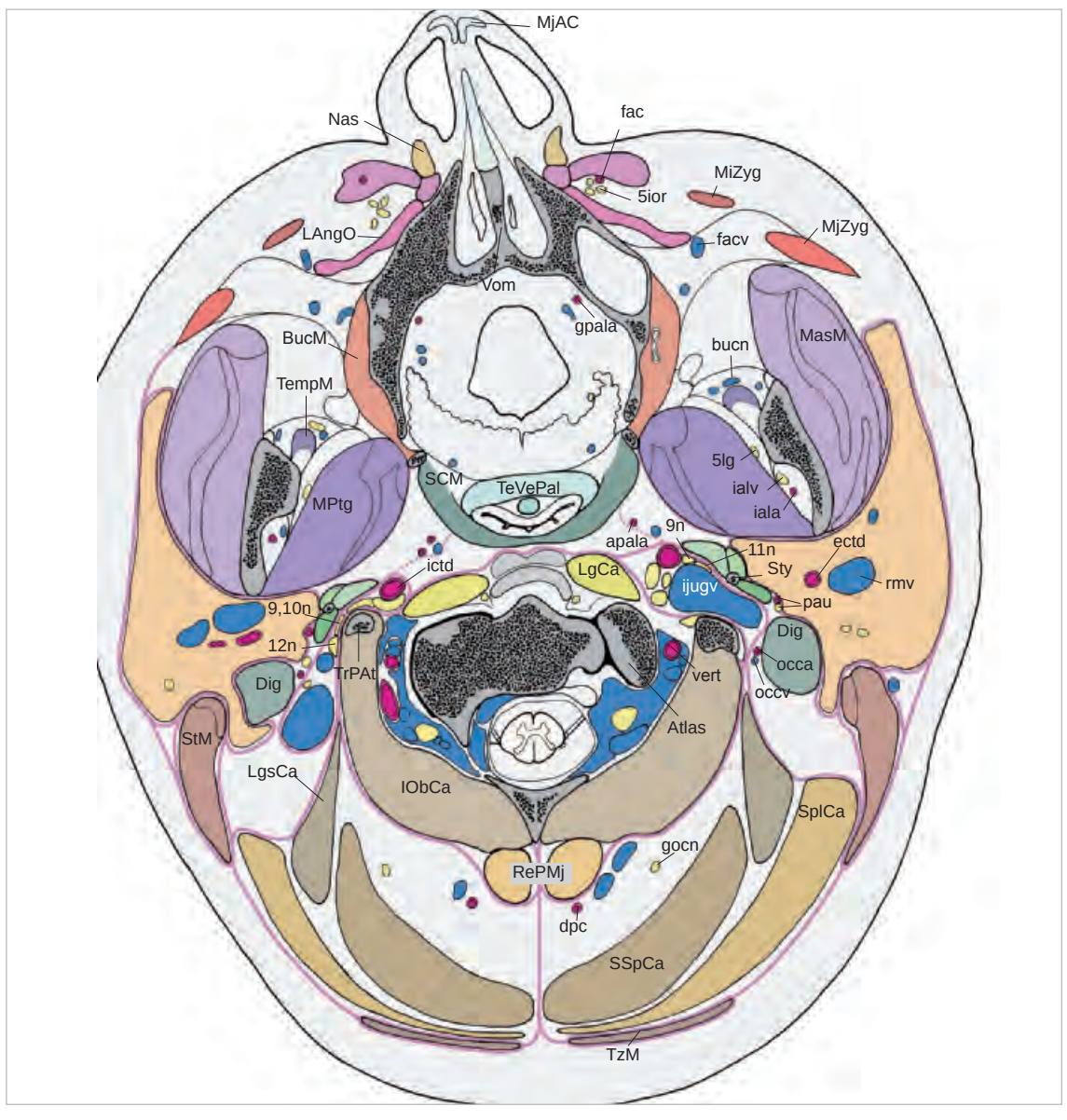


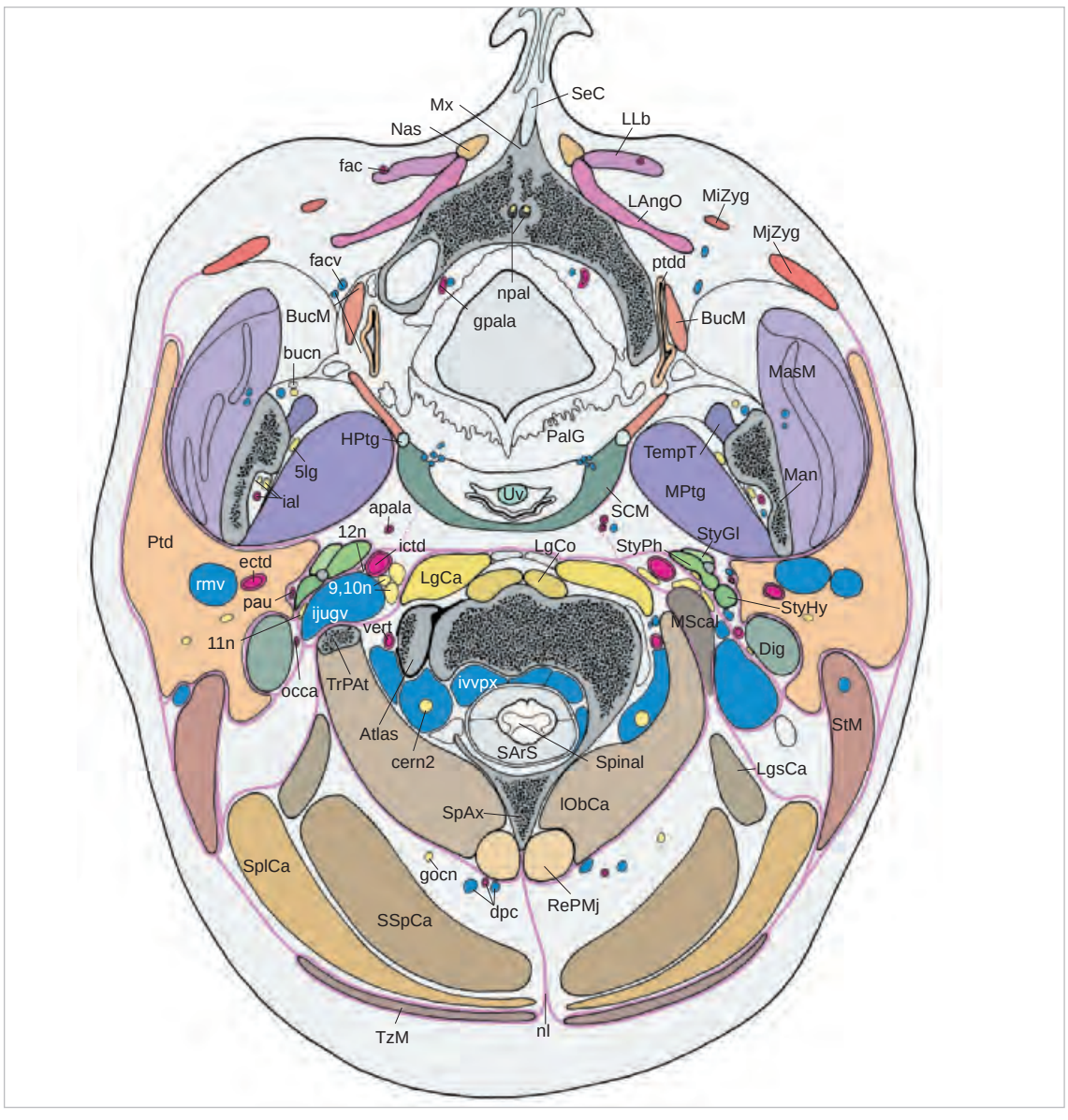


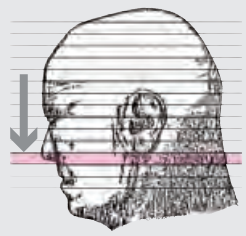












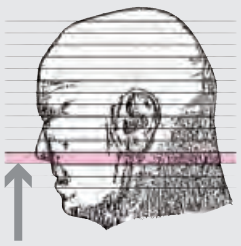
13

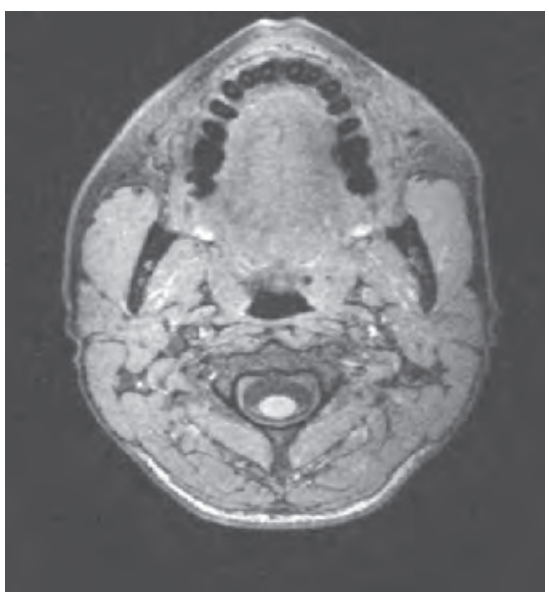
(dorsal view)

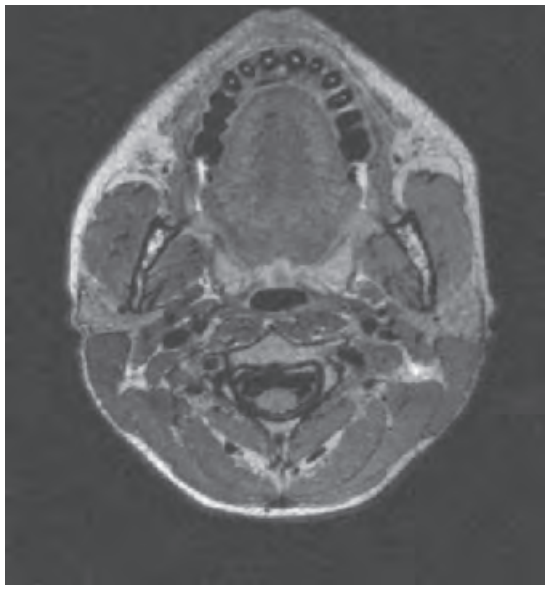
5ior	infraorbital nerve
5lg	lingual nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
apala	ascending palatine artery
Atlas	atlas
BucM	buccinator muscle
bucn	buccal nerve
cern2	cervical nerve 2
Dig	digastric muscle
dpc	deep cervical artery and vein
ectd	external carotid artery
fac	facial artery
facv	facial vein
gocn	greater occipital nerve
gpala	greater palatine artery
HPtg	hamulus of the pterygoid bone
ial	inferior alveolar artery, vein, nerve
iala	inferior alveolar artery
ialv	inferior alveolar vein
ictd	internal carotid artery
ijugv	internal jugular vein
IObCa	inferior oblique capitis muscle
ivvpx	internal vertebral venous plexus
LAngO	levator anguli oris muscle
LgCa	longus capitis muscle
LgCo	longus colli muscle
LgsCa	longissimus capitis muscle
LLb	levator labii superioris muscle
Man	mandible
MasM	masseter muscle
MiZyg	minor zygomaticus muscle
MjAC	major alar cartilage
MjZyg	major zygomaticus muscle
MPtg	medial pterygoid muscle
MScal	middle scalenus muscle, insertion of levator scapulae muscle
Mx	maxilla
Nas	nasalis muscle
nl	nuchal ligament
npal	nasopalatine artery, incisive canal
occa	occipital artery
occv	occipital vein
PalG	palatine glands
pau	posterior auricular artery and vein
Ptd	parotid gland
ptdd	parotid duct
RePMj	rectus capitis posterior major muscle
rmv	retromandibular vein
SArS	subarachnoid space
SCM	superior constrictor of the pharynx
SeC	septal nasal cartilage
SpAx	spinous process of axis
Spinal	spinal cord
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
StM	sternomastoid muscle
Sty	styloid process
StyGl	styloglossus muscle
StyHy	stylohyoid muscle
StyPh	stylopharyngeus muscle
TempM	temporalis muscle
TempT	temporalis muscle, tendon
TeVePal	tensor veli palatini muscle
TrPAt	transverse process of the atlas
TzM	trapezius muscle
Uv	uvula
vert	vertebral artery
Vom	vomer

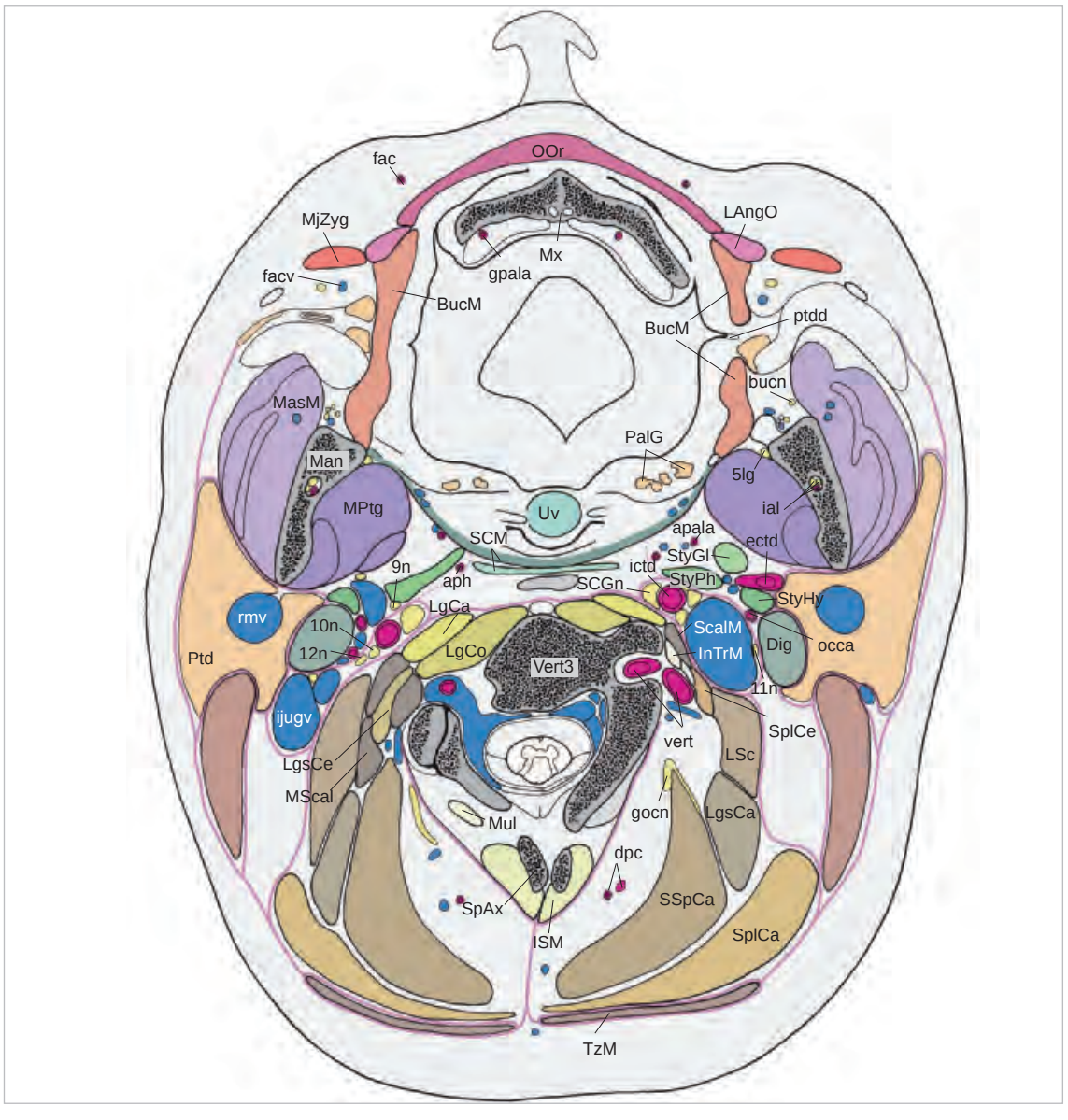
13

(ventral view)









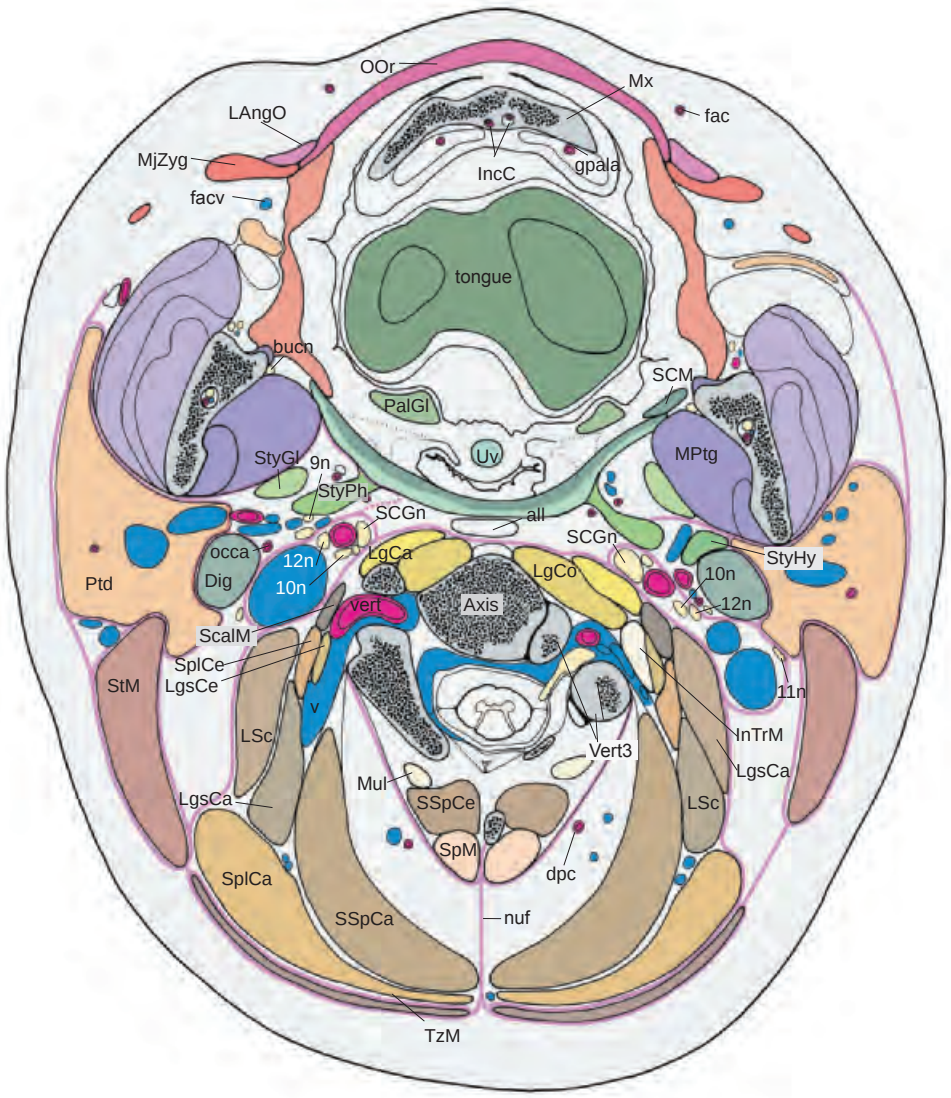


plate 14 (dorsal view)

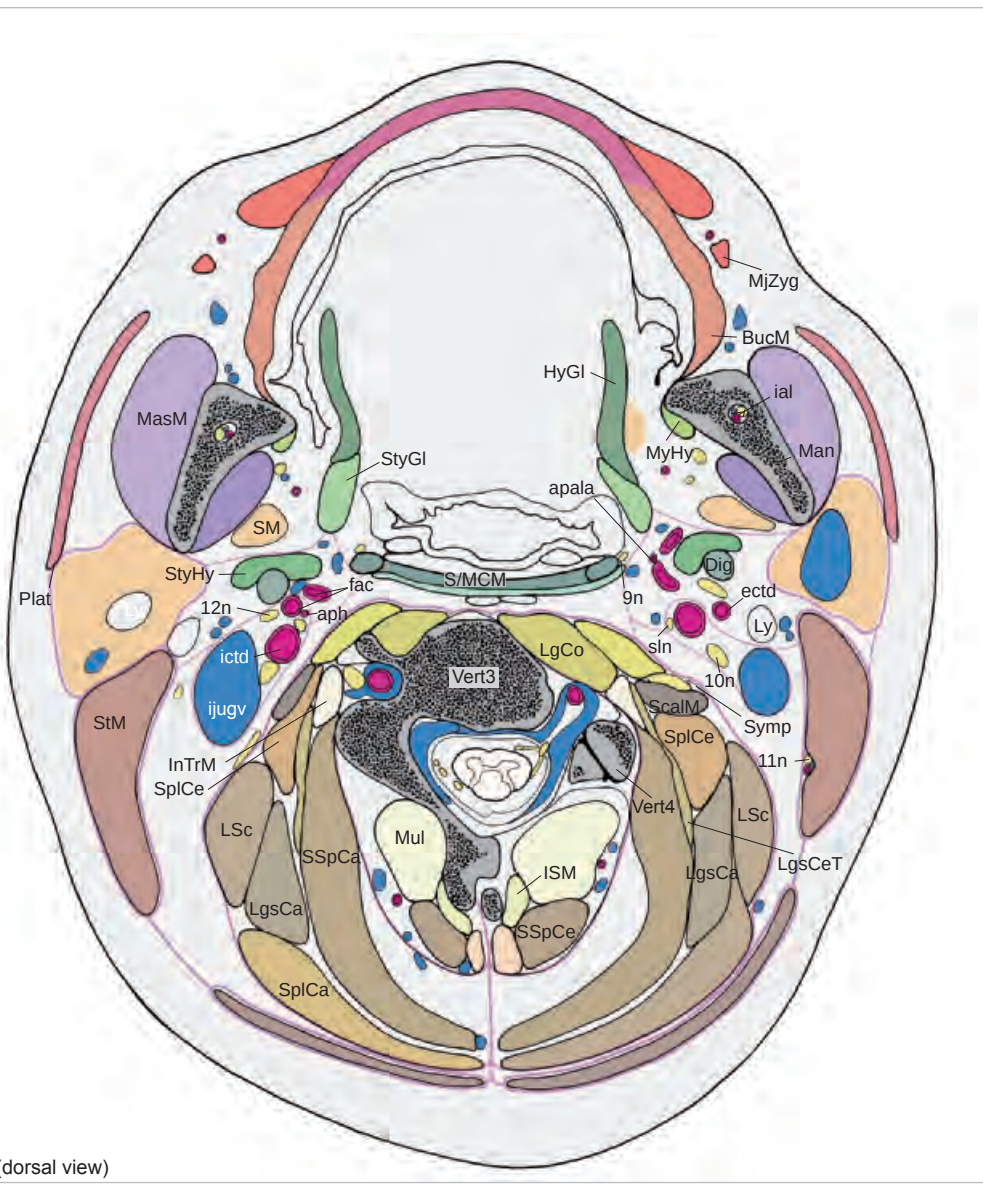
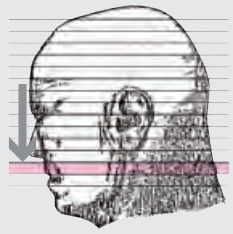


plate 15 (dorsal view)



14

(dorsal view)

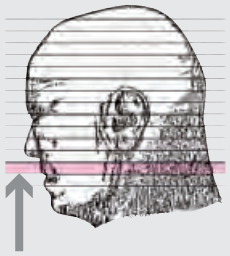
15

(dorsal view)

5lg	lingual nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
all	anterior longitudinal ligament
apala	ascending palatine artery
aph	ascending pharyngeal artery
BucM	buccinator muscle
bucn	buccal nerve
Dig	digastric muscle
dpc	deep cervical artery and vein
ectd	external carotid artery
fac	facial artery
facv	facial vein
gocn	greater occipital nerve
gpala	greater palatine artery
HyGl	hyoglossus muscle
ial	inferior alveolar artery, vein, nerve
ictd	internal carotid artery
ijugv	internal jugular vein
IncC	incisive canal w. nasopalatine artery
InTrM	intertransversarii muscles
ISM	interspinalis muscle
LAngO	levator anguli oris muscle
LgCa	longus capitis muscle
LgCo	longus colli muscle
LgsCa	longissimus capitis muscle
LgsCe	longissimus cervicis muscle
LgsCeT	longissimus cervicis muscle, tendon
LSc	levator scapulae muscle
Ly	lymph node
Man	mandible
MasM	masseter muscle
MjZyg	major zygomaticus muscle
MPtg	medial pterygoid muscle
MScal	middle scalenus muscle
Mul	multifidus muscle
Mx	maxilla
MyHy	mylohyoid muscle
nuf	nuchal fascia
occa	occipital artery
OOr	orbicularis oris muscle
PalG	palatine glands
PalGl	palatoglossus muscle
Plat	platysma
Ptd	parotid gland
ptdd	parotid duct
rmv	retromandibular vein
S/MCM	superior and middle constrictor of the pharynx
ScalM	scalenus muscle
SCGn	superior cervical ganglion
SCM	superior constrictor of the pharynx
sln	superior laryngeal nerve
SM	submandibular gland
SpAx	spinous process of axis
SplCa	splenius capitis muscle
SplCe	splenius cervicis muscle
SpM	spinalis muscle
SSpCa	semispinalis capitis muscle
SSpCe	semispinalis cervicis muscle
StM	sternomastoid muscle
StyGl	styloglossus muscle
StyHy	stylohyoid muscle
StyPh	stylopharyngeus muscle
Symp	sympathetic trunk
TzM	trapezius muscle
Uv	uvula
vert	vertebral artery
Vert3	third vertebra
Vert4	fourth vertebra

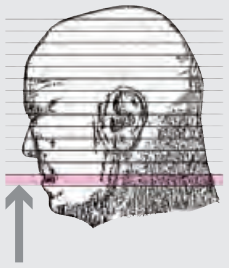
14

(ventral view)



15

(ventral view)



9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
all	anterior longitudinal ligament
apala	ascending palatine artery
aph	ascending pharyngeal artery
BucM	buccinator muscle
bucn	buccal nerve
Dig	digastric muscle
DigT	digastric muscle, tendon
DpAO	depressor anguli oris muscle
dpc	deep cervical artery and vein
ectd	external carotid artery
fac	facial artery
GeGl	genioglossus muscle
GHHy	greater horn of hyoid bone
HyGl	hyoglossus muscle
ial	inferior alveolar artery, vein, nerve
ictd	internal carotid artery
ijugv	internal jugular vein
InTrM	intertransversarii muscles
ISM	interspinalis muscle
ivvpx	internal vertebral venous plexus
lga	lingual artery
LgCa	longus capitis muscle
LgCo	longus colli muscle
LgsCa	longissimus capitis muscle
LgsCe	longissimus cervicis muscle
LgsCeT	longissimus cervicis muscle, tendon
LSc	levator scapulae muscle
Ly	lymph node
MasM	masseter muscle
MjZyg	major zygomaticus muscle
MPtg	medial pterygoid muscle
Mul	multifidus muscle
MyHy	mylohyoid muscle
OOr	orbicularis oris muscle
PalPh	palatopharyngeus muscle
Plat	platysma
Ptd	parotid gland
RisM	risorius muscle
rmv	retromandibular vein
S/MCM	superior and middle constrictor of the pharynx
ScalM	scalenus muscle
SCGn	superior cervical ganglion
sln	superior laryngeal nerve
SM	submandibular gland
SplCa	splenius capitis muscle
SplCe	splenius cervicis muscle
SpM	spinalis muscle
SSpCa	semispinalis capitis muscle
SSpCe	semispinalis cervicis muscle
StM	sternomastoid muscle
StyGl	styloglossus muscle
StyHy	stylohyoid muscle
StyPh	stylopharyngeus muscle
Symp	sympathetic trunk
TzM	trapezius muscle
v	vein
vert	vertebral artery
Vert4	fourth cervical vertebra

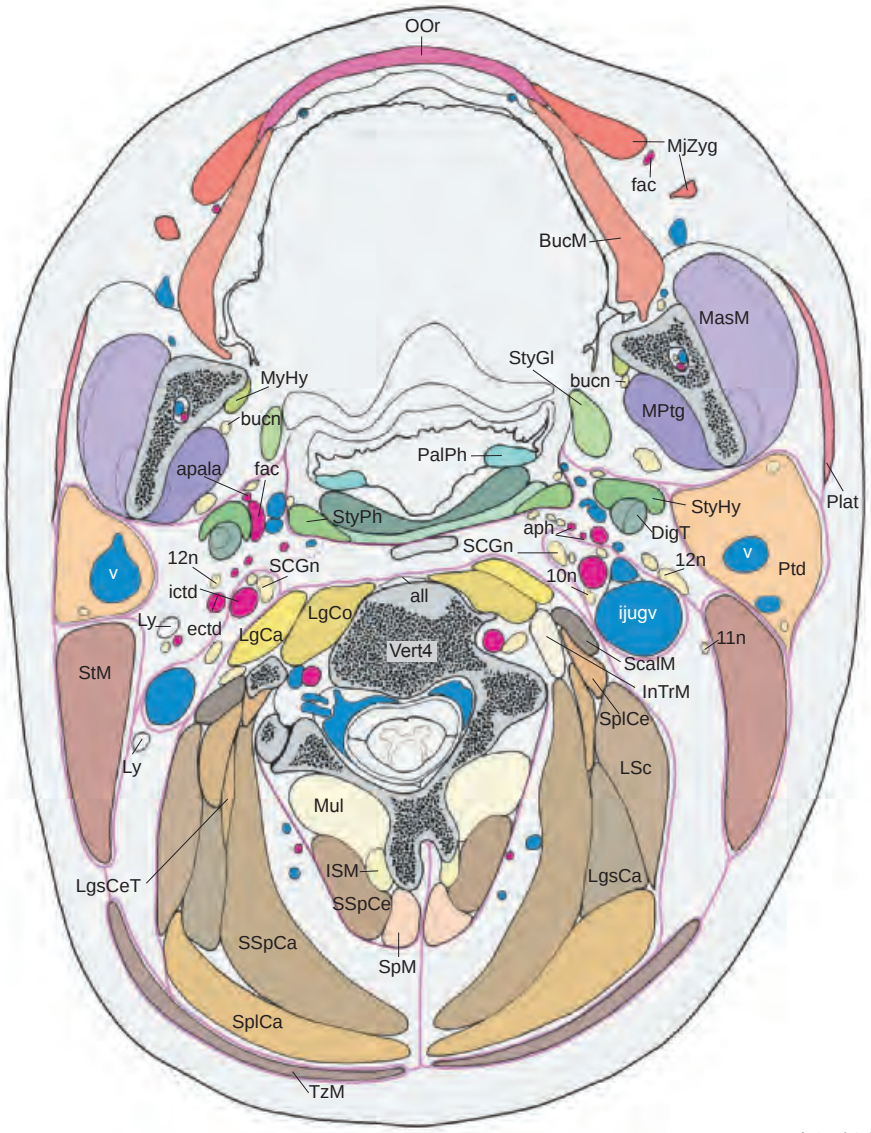


plate 14 (ventral view)

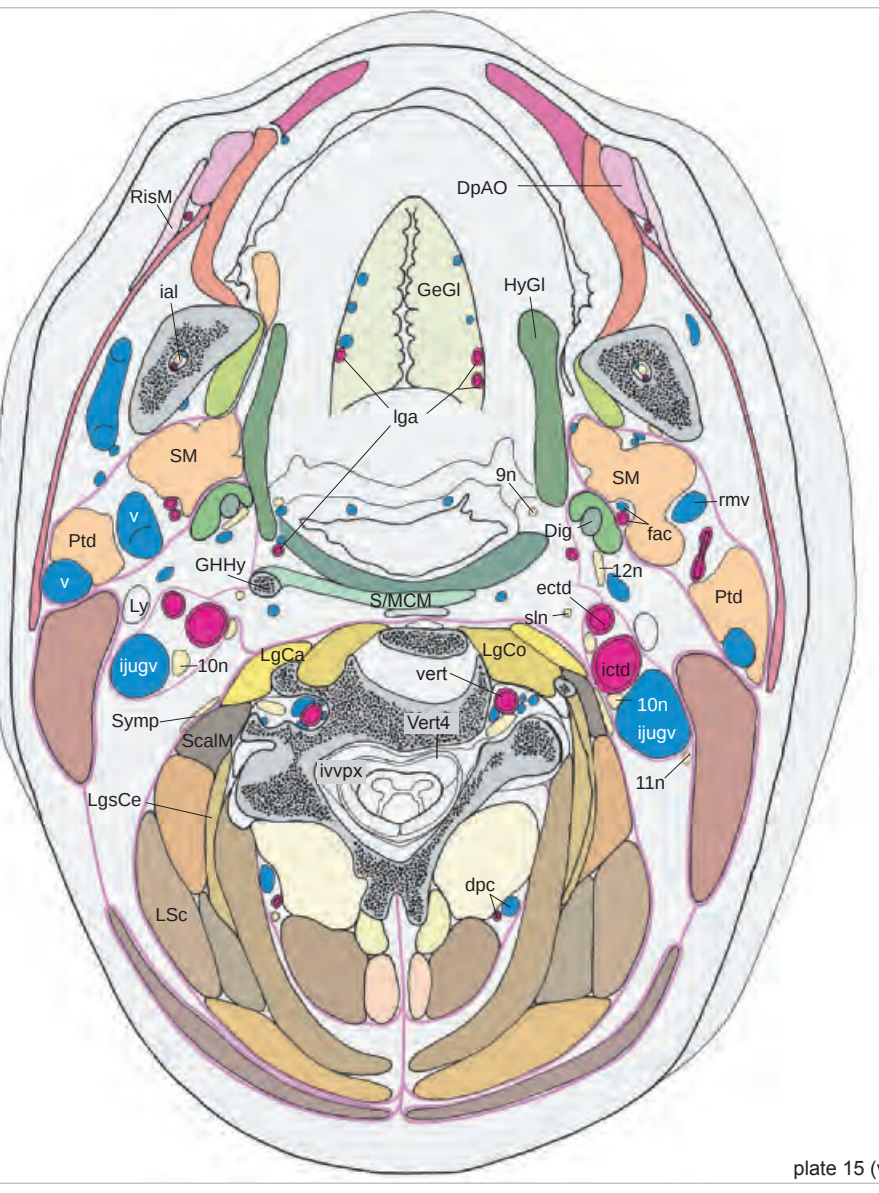


plate 15 (ventral view)

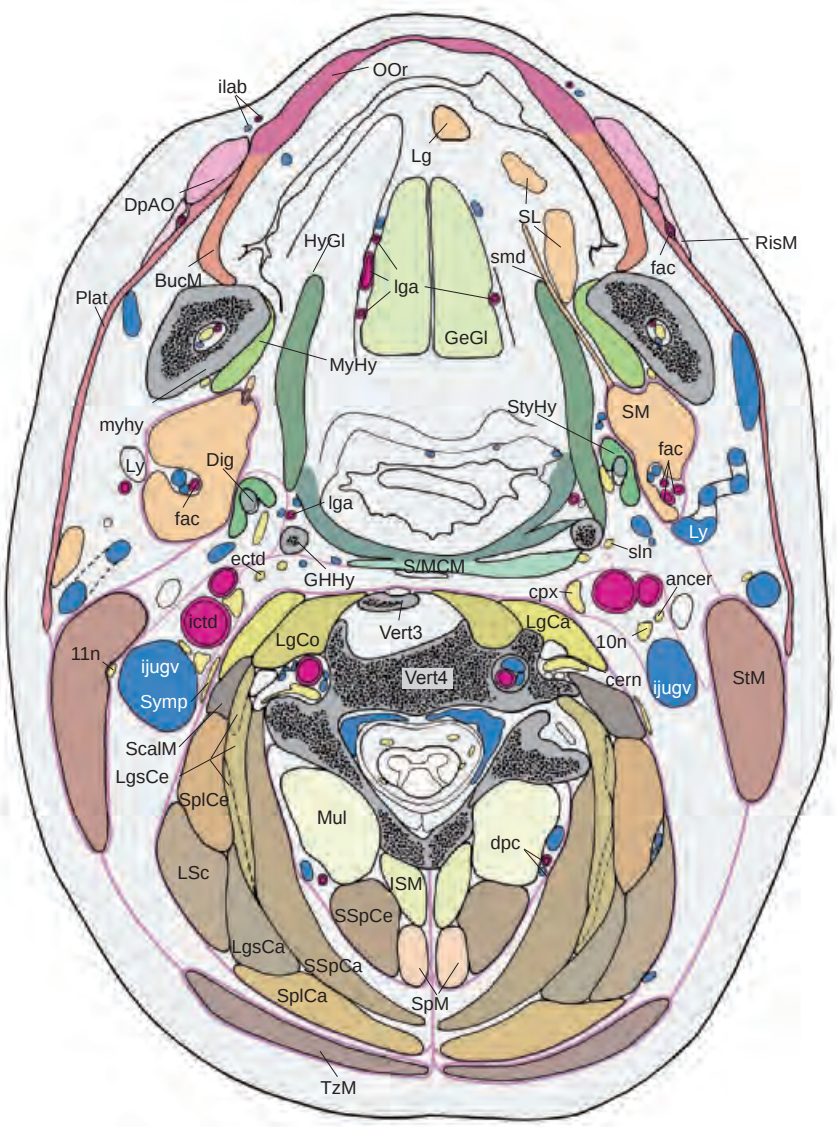


plate 16 (dorsal view)

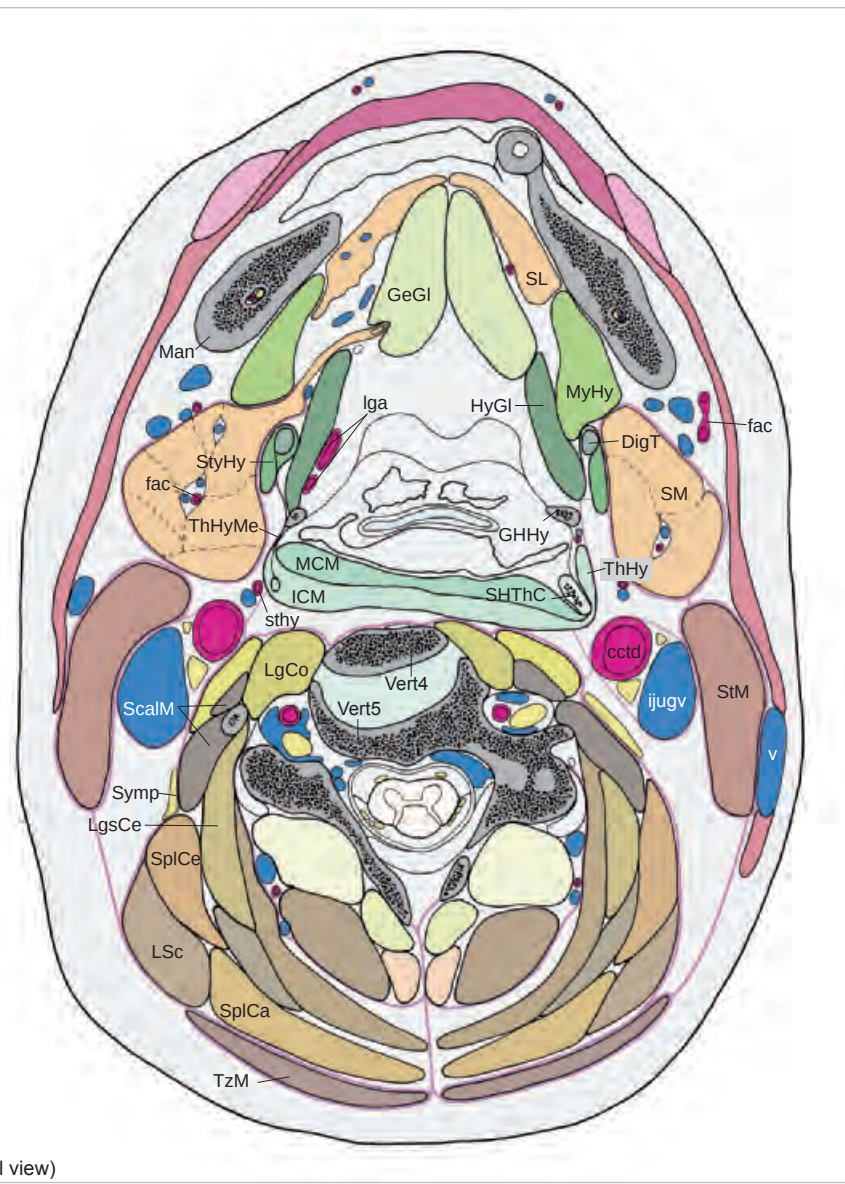
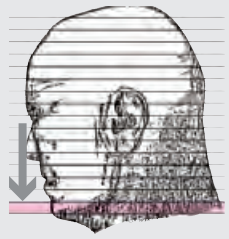


plate 17 (dorsal view)

16

(dorsal view)



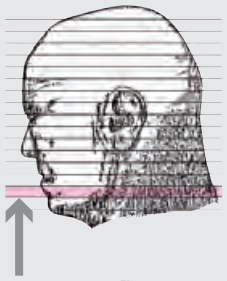
17

(dorsal view)

10n	vagus nerve
11n	accessory nerve
ancer	ansa cervicalis
BucM	buccinator muscle
cctd	common carotid artery
cern	cervical nerve
cpx	carotid plexus
Dig	digastric muscle
DigT	digastric muscle, tendon
DpAO	depressor anguli oris muscle
dpc	deep cervical artery and vein
ectd	external carotid artery
fac	facial artery (glandular branches)
GeGl	genioglossus muscle
GHHy	greater horn of hyoid bone
HyGl	hyoglossus muscle
ICM	inferior constrictor of the pharynx
ictd	internal carotid artery
ijugv	internal jugular vein
ilab	inferior labial artery and vein
ISM	interspinalis muscle
Lg	lingual gland
lga	lingual artery
LgCa	longus capitis muscle
LgCo	longus colli muscle
LgsCa	longissimus capitis muscle
LgsCe	longissimus cervicis muscle
LSc	levator scapulae muscle
Ly	lymph node
Man	mandible
MCM	middle constrictor of the pharynx
Mul	multifidus muscle
MyHy	mylohyoid muscle
myhy	mylohyoid nerve
OOr	orbicularis oris muscle
Plat	platysma
RisM	risorius muscle
S/MCM	superior and middle constrictor of the pharynx
ScalM	scalenus muscle
SHThC	superior horn of thyroid cartilage
SL	sublingual gland
sln	superior laryngeal nerve
SM	submandibular gland
smd	submandibular duct
SplCa	splenius capitis muscle
SplCe	splenius cervicis muscle
SpM	spinalis muscle
SSpCa	semispinalis capitis muscle
SSpCe	semispinalis cervicis muscle
sthy	superior thyroid artery
StM	sternomastoid muscle
StyHy	stylohyoid muscle
Symp	sympathetic trunk
ThHy	thyrohyoid muscle
ThHyMe	thyrohyoid membrane
TzM	trapezius muscle
v	vein
Vert3	third cervical vertebra
Vert4	fourth cervical vertebra
Vert5	fifth cervical vertebra

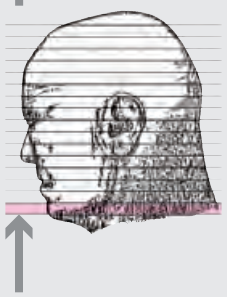
16

(ventral view)



17

(ventral view)



10n	vagus nerve
ancer	ansa cervicalis
BHy	body of hyoid bone
BucM	buccinator muscle
cctd	common carotid artery
cern	cervical nerve
Dig	digastric muscle
DpAO	depressor anguli oris muscle
dpc	deep cervical artery and vein
DpLb	depressor labii inferioris muscle
fac	facial artery (glandular branches)
facv	facial vein
GeGl	genioglossus muscle
GeHy	geniohyoid muscle
GHHy	greater horn of hyoid bone
HyGl	hyoglossus muscle
ICCe	iliocostalis cervicis muscle
ICM	inferior constrictor of the pharynx
ijugv	internal jugular vein
ilab	inferior labial artery and vein
ISM	interspinalis muscle
lga	lingual artery
LgCa	longus capitis muscle
LgCo	longus colli muscle
LgsCa	longissimus capitis muscle
LgsCe	longissimus cervicis muscle
LSc	levator scapulae muscle
Ly	lymph node
ManC	mandibular canal
MCM	middle constrictor of the pharynx
MentM	mentalis muscle
Mul	multifidus muscle
MyHy	mylohyoid muscle
OmHy	omohyoid muscle
OOr	orbicularis oris muscle
Plat	platysma
ScalM	scalenus muscle
SHThC	superior horn of thyroid cartilage
SL	sublingual gland
sln	superior laryngeal nerve
SM	submandibular gland
smd	submandibular duct
SplCa	splenius capitis muscle
SplCe	splenius cervicis muscle
SplM	splenius capitis and cervicis muscle
SpM	spinalis muscle
SSpCa	semispinalis capitis muscle
SSpCe	semispinalis cervicis muscle
sthy	superior thyroid artery
StM	sternomastoid muscle
StyHy	stylohyoid muscle
Symp	sympathetic trunk
ThC	thyroid cartilage
ThHy	thyrohyoid muscle
ThHyMe	thyrohyoid membrane
TrP4	transverse process of fourth vertebra
TzM	trapezius muscle
v	vein
vert	vertebral artery
Vert4	fourth cervical vertebra
Vert5	fifth cervical vertebra
Vert6	sixth cervical vertebra

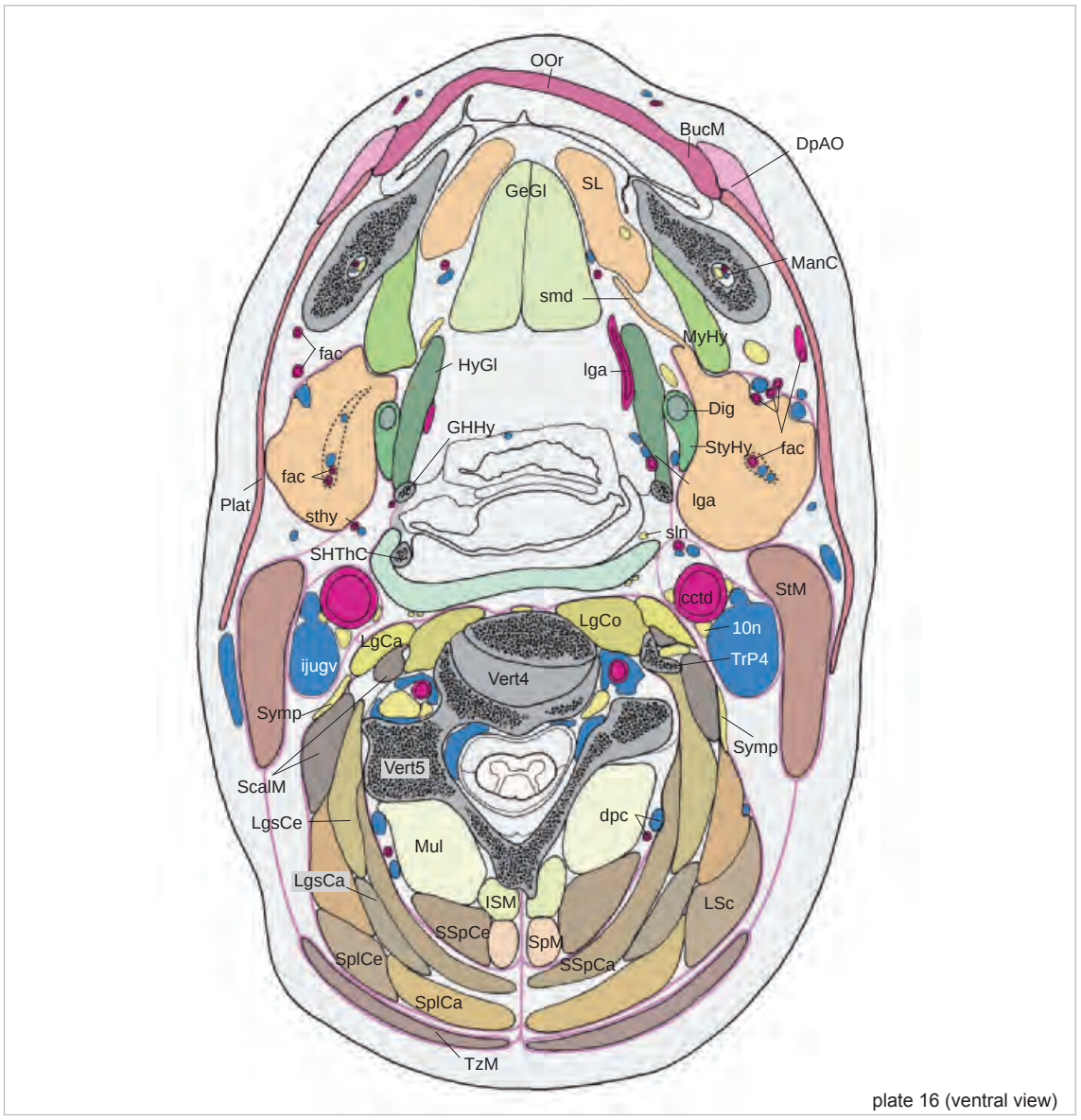


plate 16 (ventral view)

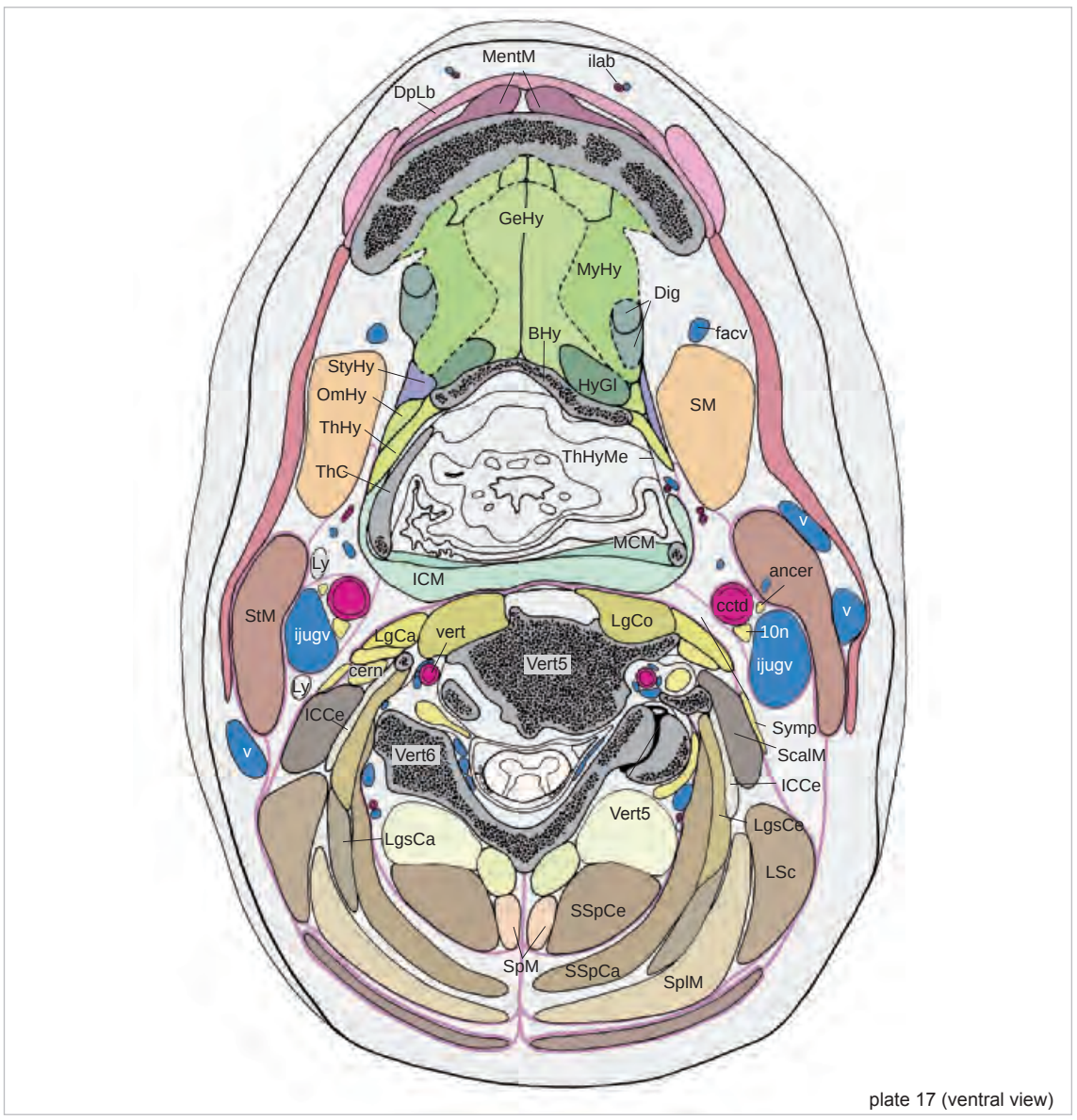
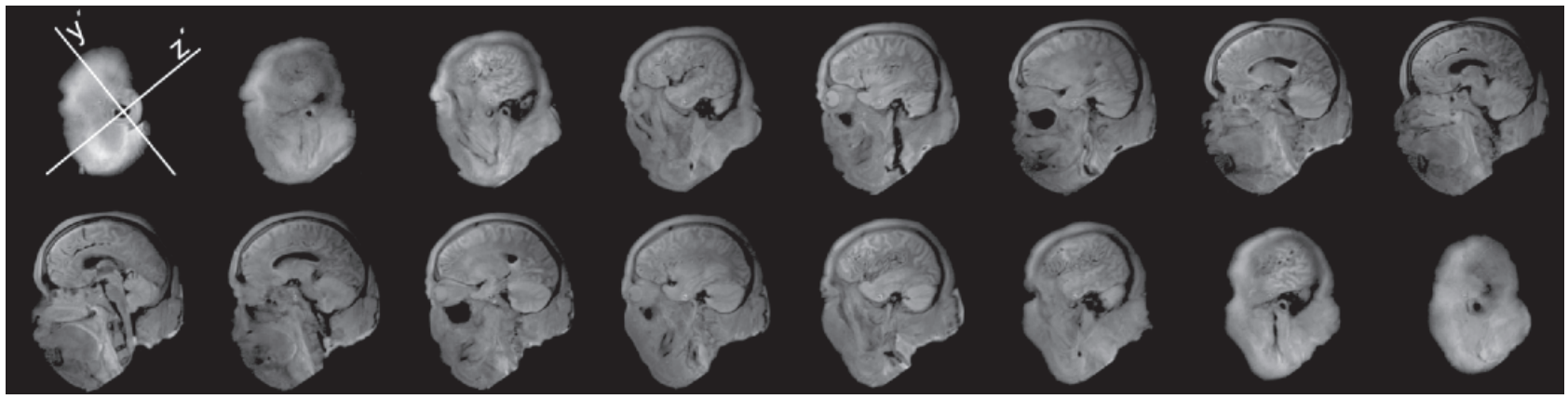


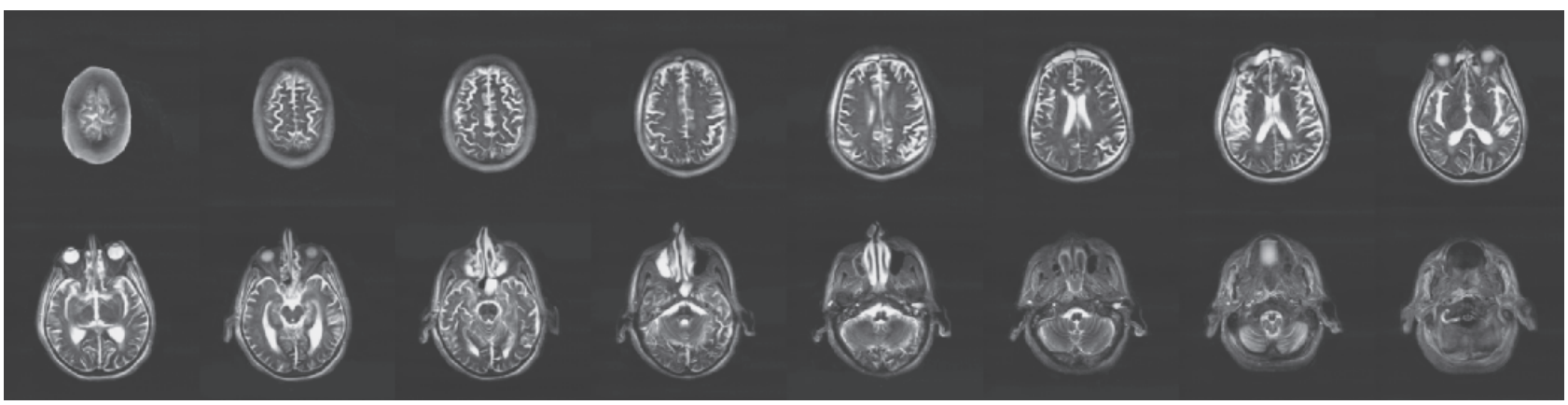
plate 17 (ventral view)

1.3 Coronal Atlas of the Brain in the Head

Sagittal plane:



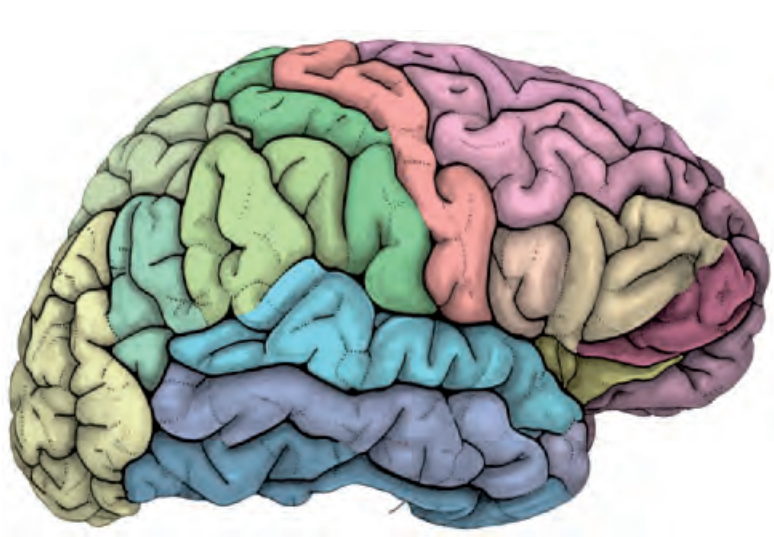
y´- direction:



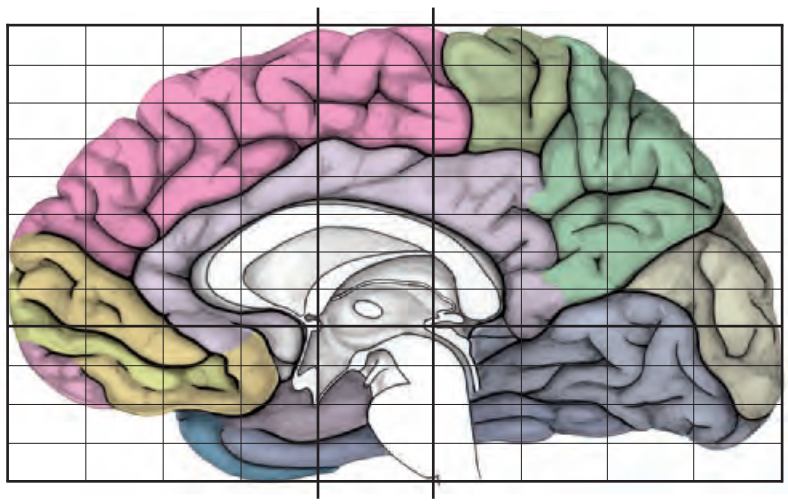
z´- direction:

MR-images of the head shown on the following pages.

The head whose sections are depicted on the following pages was imaged in three orthgonal planes using the following parameters: 0.15 Tesla, matrix 256 x 256, field of view 25 cm, multislice, slice thickness 5 mm, 4 excitations, sequence: 5000/160. These heavy T2 weighted images highlight fluid-containing structures. Note that artificial fluid collections are visible in the nasal and paranasal cavities. The top panel presents the sagittal MRIs and specifies the planes of sectioning of the middle and lower panel. Orientation of these MRIs was based on the brainstem axis. Therefore the orientation of the coronal MRIs in the lower panel corresponds to the plane of cryo-sectioning of the head and direct comparisons can be made with photographs and diagrams of the following pages. The middle panel presents the horizontal MRIs from top to the bottom.

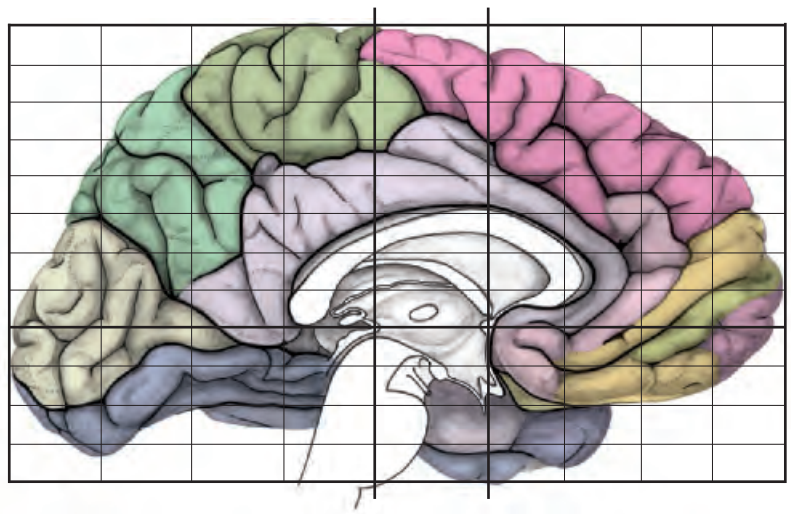


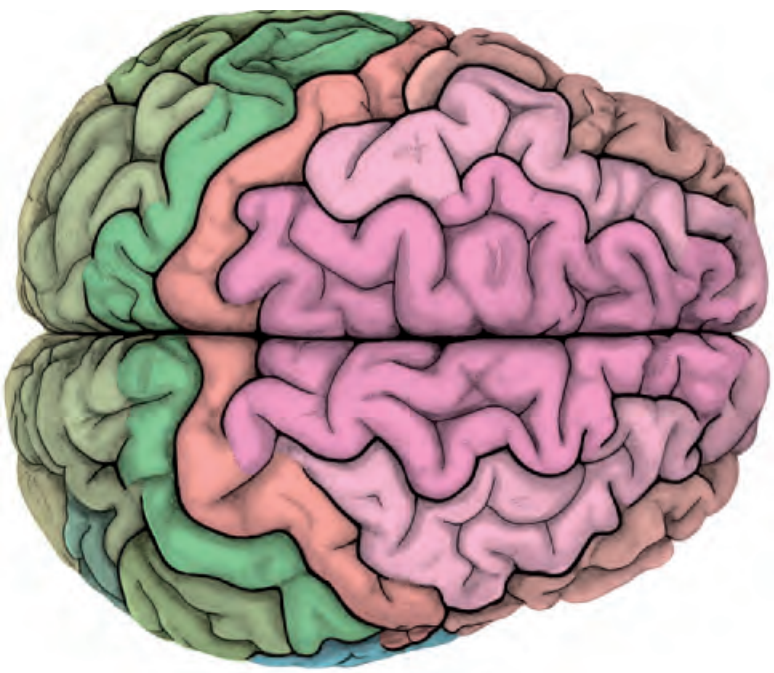
VCA

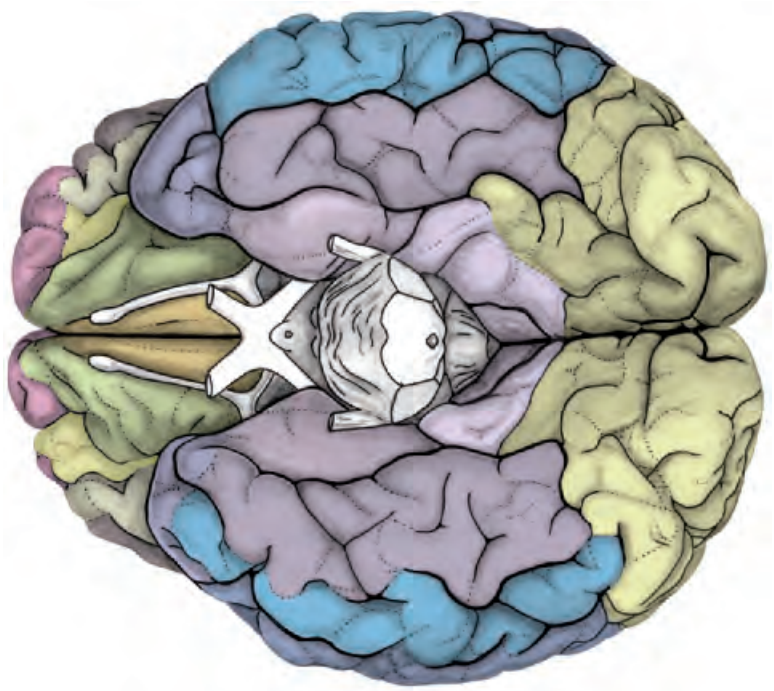


ICL

VCA

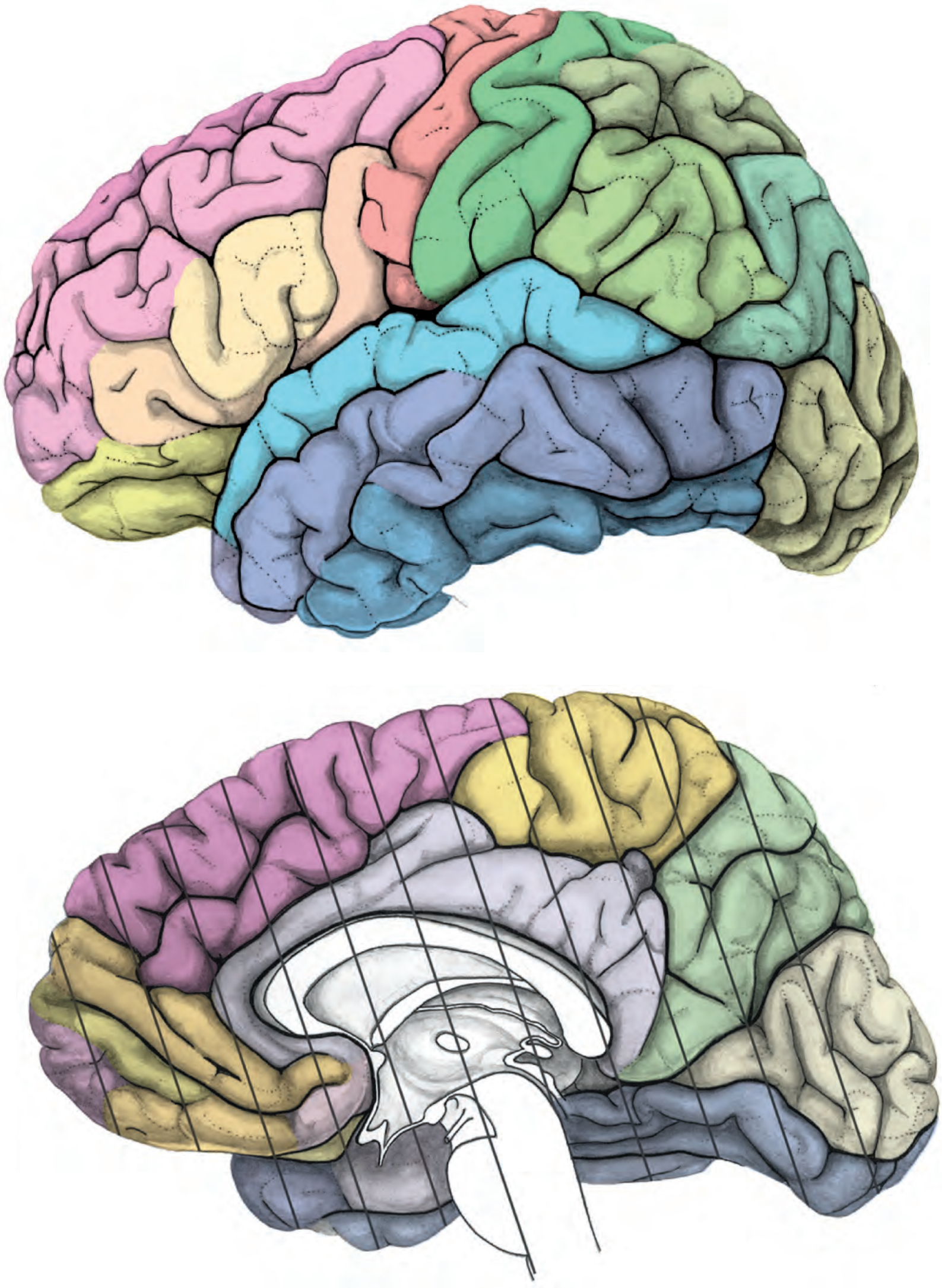




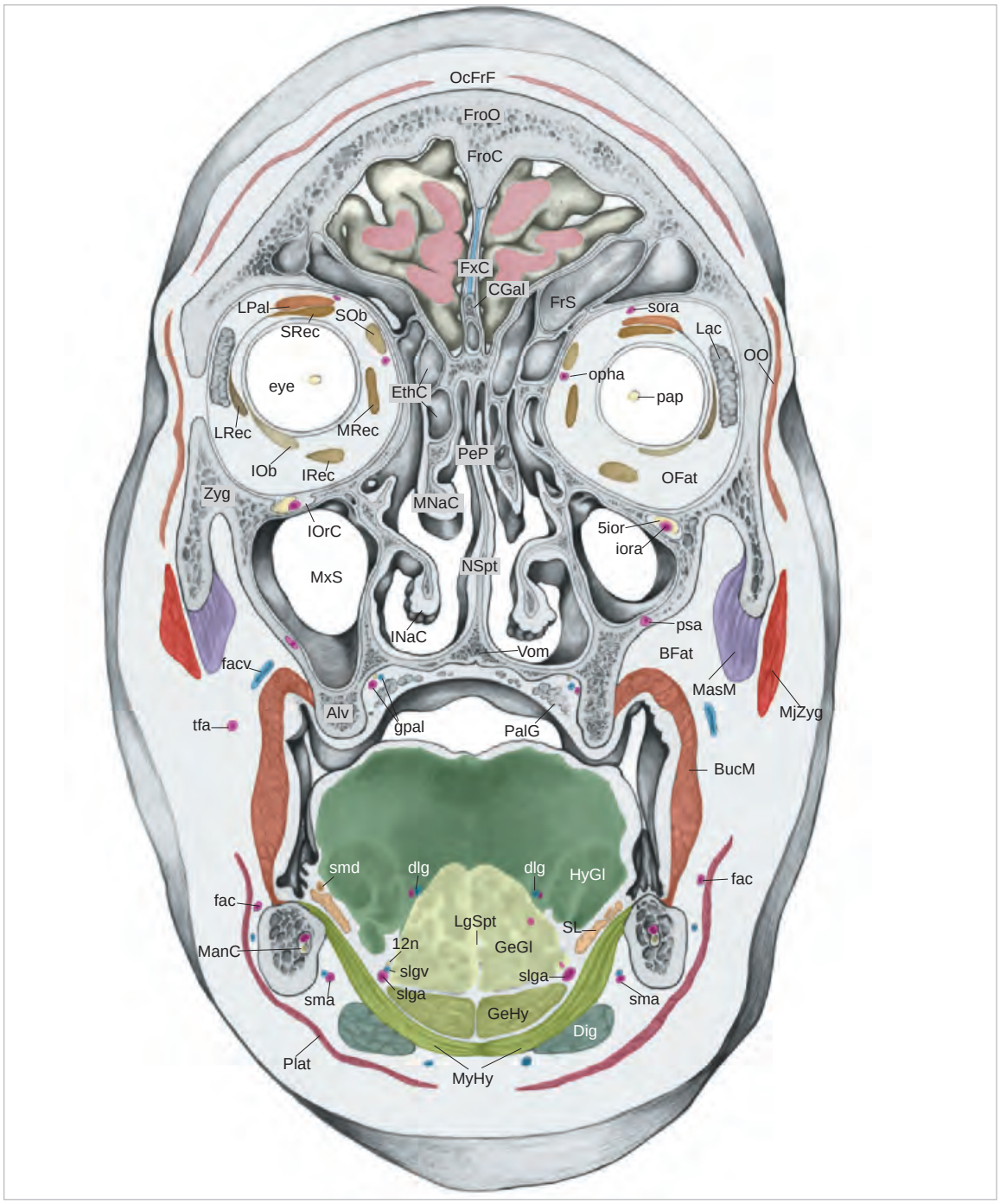


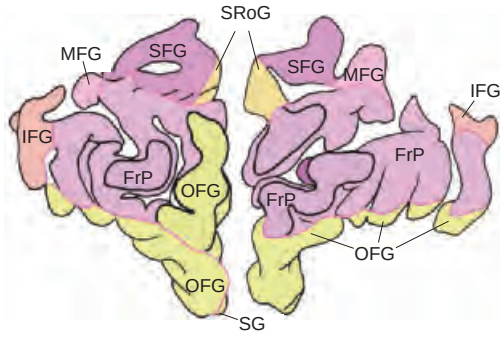
Surface views of the brain which is shown in the subsequent pages. The most important gyri are delineated.

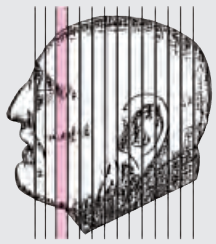
The midsagittal views depict the brain with the stereotaxic space.



Surface views of the left hemisphere of the brain which has been sectioned in the coronal plane (-20° angulation) as indicated. The drawing of the midsagittal view has been mirror-imaged in order to help identifying structures which lie in the same plane of sectioning with regard to the lateral and median view.

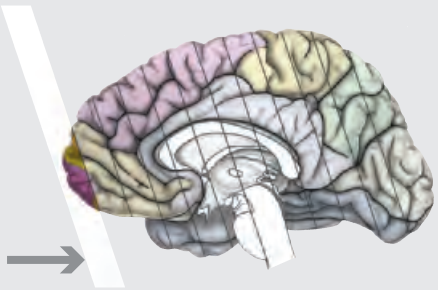






4

(anterior view)



Intracranial structures:

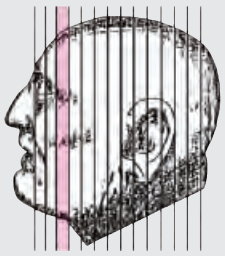
FrP	frontopolar cortex
FxC	falx cerebri
IFG	inferior frontal gyrus
MFG	middle frontal gyrus
OFG	orbitofrontal gyri
SFG	superior frontal gyrus
SG	straight gyrus
SRoG	superior rostral gyrus

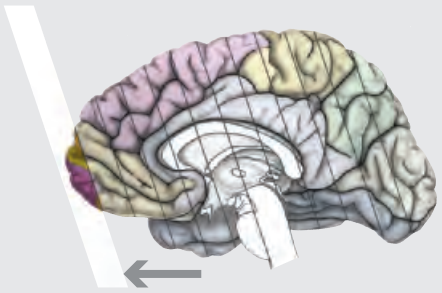
Peripheral structures:

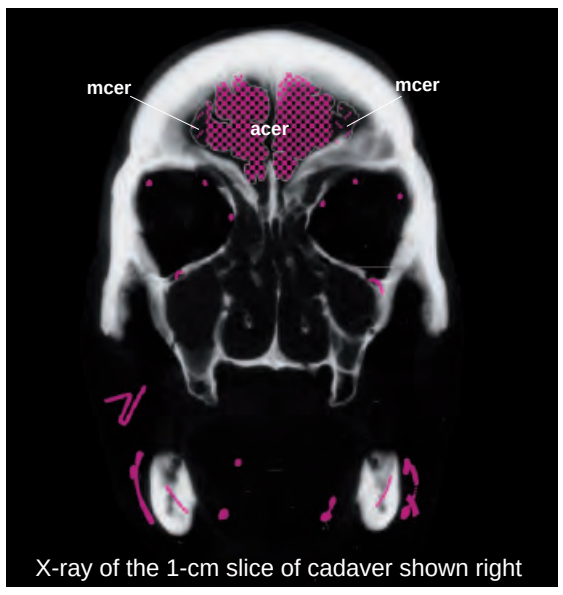
5ior	infraorbital nerve
12n	hypoglossal nerve (lingual branch)
Alv	alveolar process of maxilla
BFat	buccal fat pad
BucM	buccinator muscle
CGal	crista galli
Dig	digastric muscle, ant. belly
dlg	deep lingual artery and vein
EthC	ethmoidal cell(s)
fac	facial artery
facv	facial vein
FroC	frontal crest
FroO	frontal bone, orbital part
FrS	frontal sinus
GeGl	genioglossus muscle
GeHy	geniohyoid muscle
gpal	greater palatine artery, nerve, vein
HyGl	hyoglossus muscle
INaC	inferior nasal concha
IOb	inferior oblique muscle
iora	infraorbital artery
IOrC	infraorbital canal
IRec	inferior rectus muscle
Lac	lacrimal gland
LgSpt	lingual septum
LPal	levator palpebrae superioris muscle
LRec	lateral rectus muscle
ManC	mandibular canal
MasM	masseter muscle
MjZyg	major zygomaticus muscle
MNaC	middle nasal concha
MRec	medial rectus muscle
MxS	maxillary sinus
MyHy	mylohyoid muscle
NSpt	nasal septum
OcFrF	occipito-frontal muscle, frontal belly
OFat	orbital fat body
OO	orbicularis oculi muscle
opha	ophthalmic artery
PalG	palatine glands
pap	optic papilla
PeP	perpendicular plate
Plat	platysma
psa	posterior superior alveolar artery
SL	sublingual gland
slga	sublingual artery
slgv	sublingual vein
sma	submental artery
smd	submandibular duct
SOb	superior oblique muscle
sora	supraorbital artery
SRec	superior rectus muscle
tfa	transverse facial artery
Vom	vomer
Zyg	zygomatic bone

4

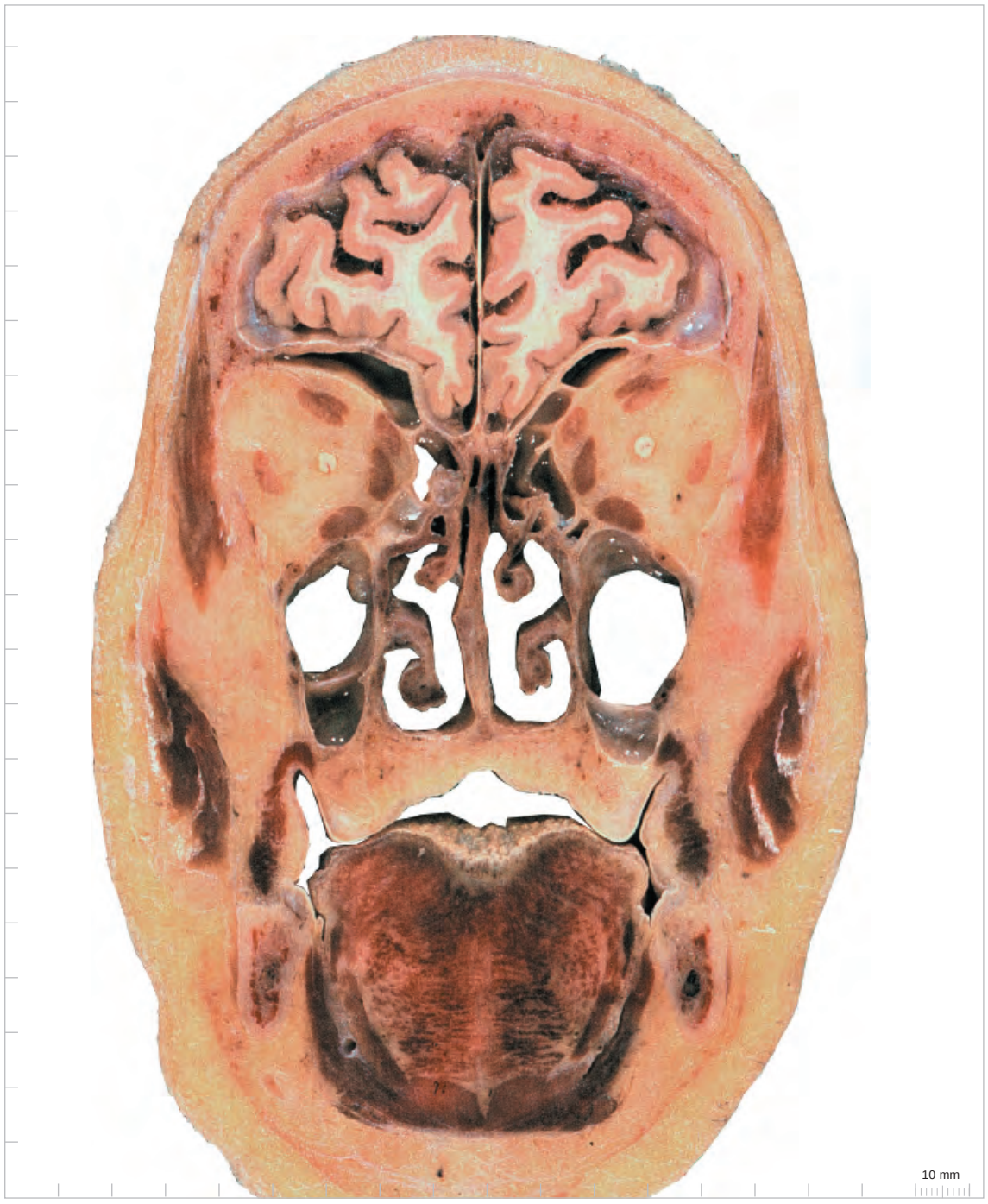
(posterior view)

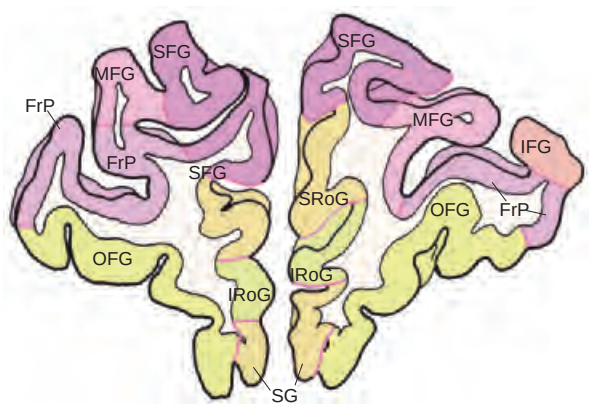


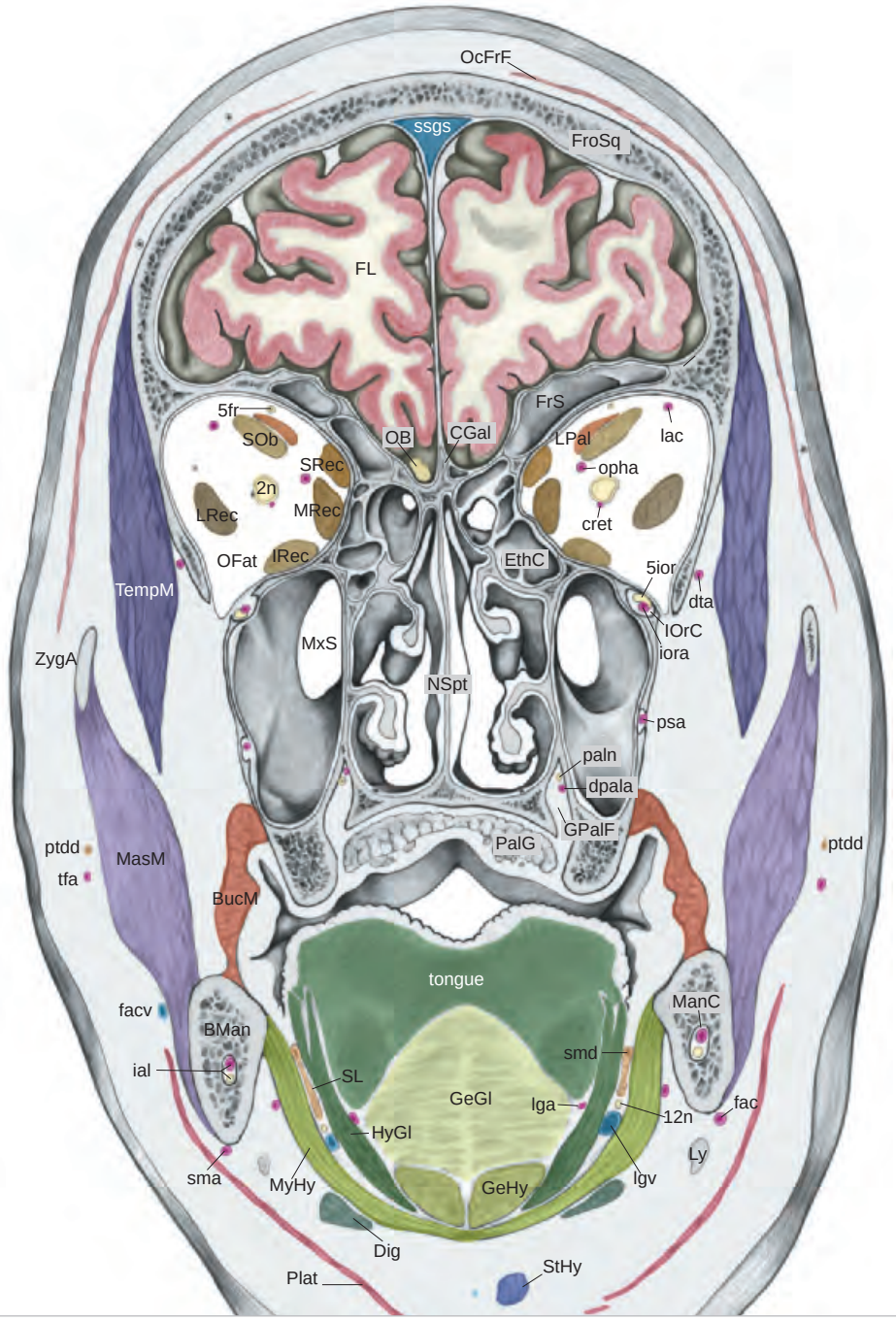


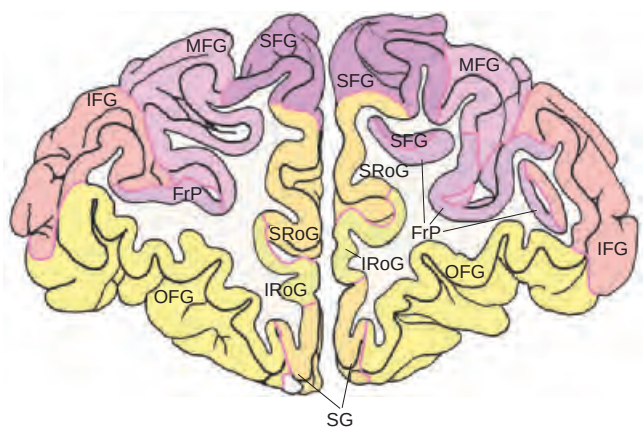


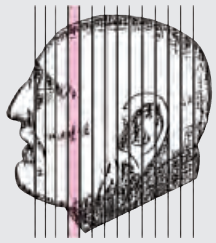
X-ray of the 1-cm slice of cadaver shown right





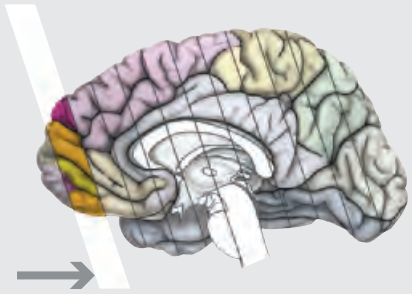






5

(anterior view)



Intracranial structures:

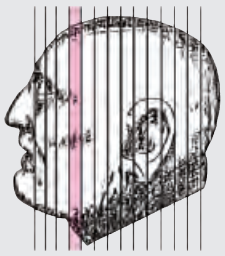
acer	anterior cerebral artery
FrP	frontopolar cortex
FL	frontal lobe
IFG	inferior frontal gyrus
IRoG	inferior rostral gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
OB	olfactory bulb
OFG	orbitofrontal gyri
SFG	superior frontal gyrus
SG	straight gyrus
SRoG	superior rostral gyrus
ssgs	superior sagittal sinus

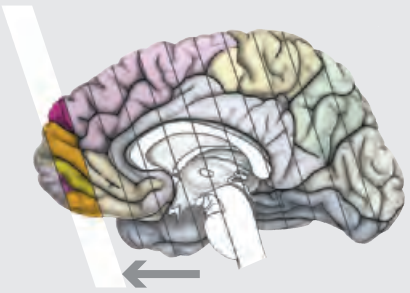
Peripheral structures:

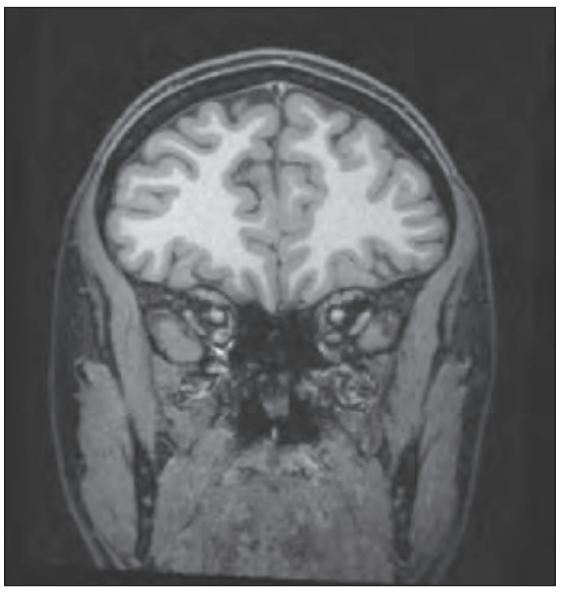
2n	optic nerve
5fr	frontal nerve
5ior	infraorbital nerve
12n	hypoglossal nerve
BMan	body of mandible
BucM	buccinator muscle
CGal	crista galli
cret	central artery of retina
Dig	digastric muscle, ant. belly
dpala	descending palatine artery
dta	deep temporal artery
EthC	ethmoidal cell
fac	facial artery
facv	facial vein
FroSq	frontal bone, squamosal part
FrS	frontal sinus
GeGl	genioglossus muscle
GeHy	geniohyoid muscle
GPalF	greater palatine foramen
HyGl	hyoglossus muscle
ial	inferior alveolar artery, vein, nerve
iora	infraorbital artery
IOrC	infraorbital canal
IRec	inferior rectus muscle
lac	lacrimal artery
lga/lgv	lingual artery / vein
LPal	levator palpebrae superioris muscle
LRec	lateral rectus muscle
Ly	submental lymph node
ManC	mandibular canal
MasM	masseter muscle
MRec	medial rectus muscle
MxS	maxillary sinus
MyHy	mylohyoid muscle
NSpt	nasal septum
OcFrF	occipito-frontal muscle, frontal belly
OFat	orbital fat body
opha	ophthalmic artery
PalG	palatine glands
paln	palatine nerve
Plat	platysma
psa	posterior superior alveolar artery
ptdd	parotid duct
SL	sublingual gland
sma	submental artery
smd	submandibular duct
SOb	superior oblique muscle
SRec	superior rectus muscle
StHy	sternohyoid muscle
TempM	temporalis muscle
tfa	transverse facial artery
ZygA	zygomatic arch

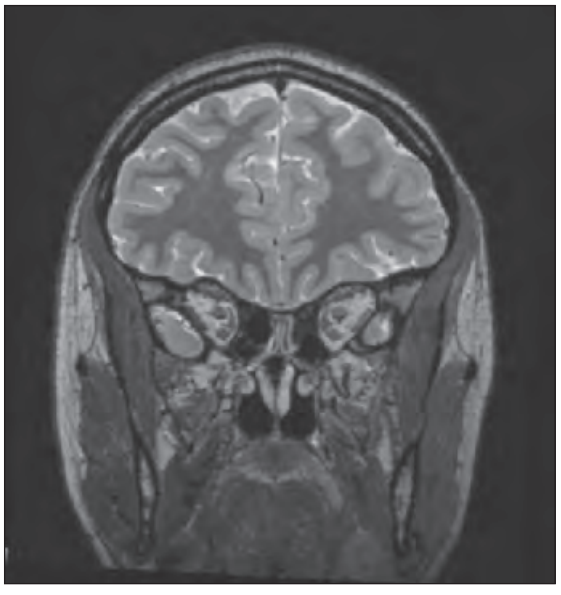
5

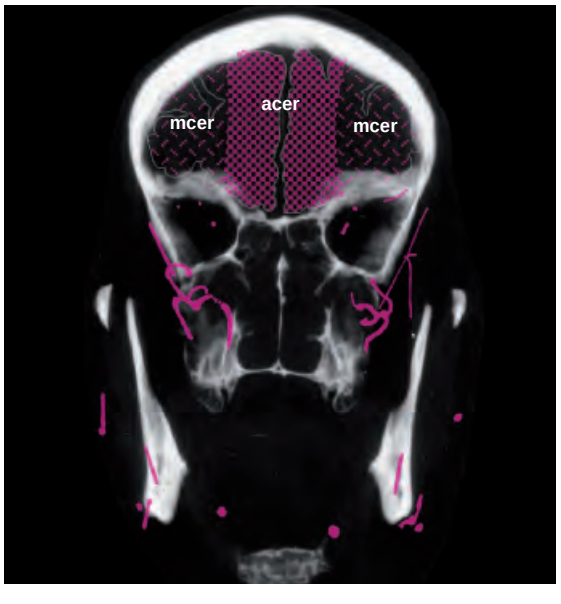
(posterior view)

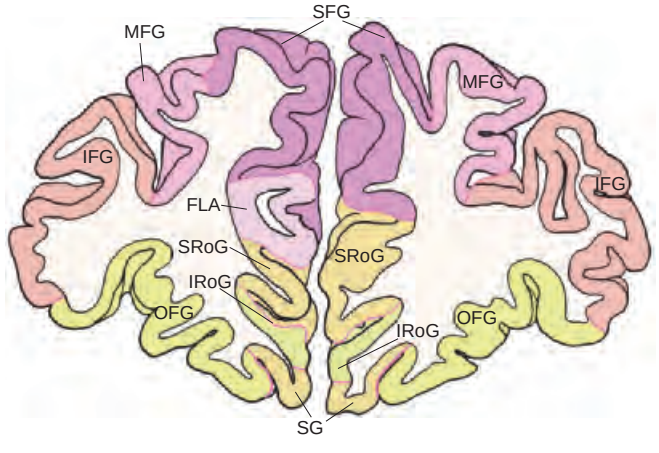


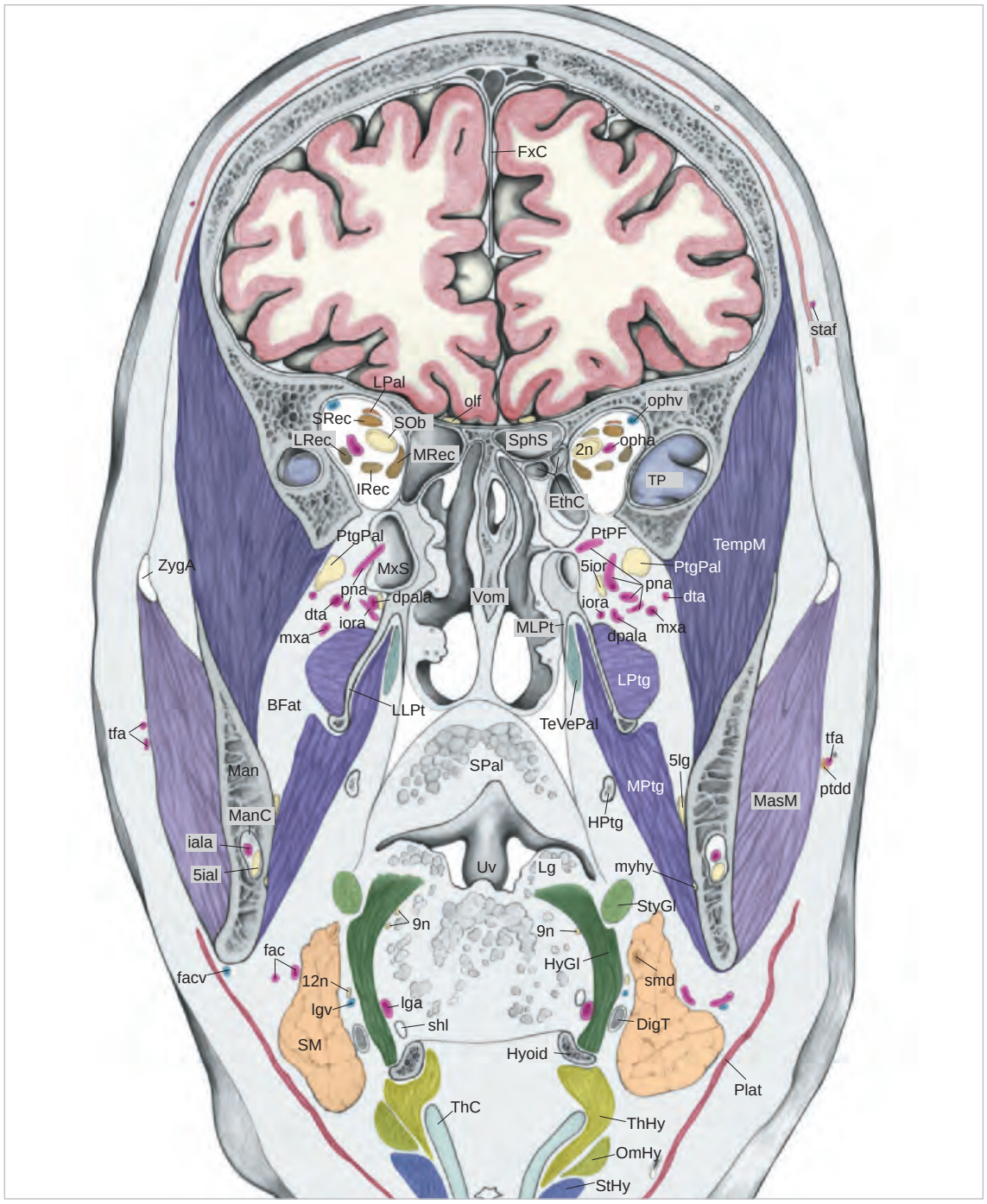


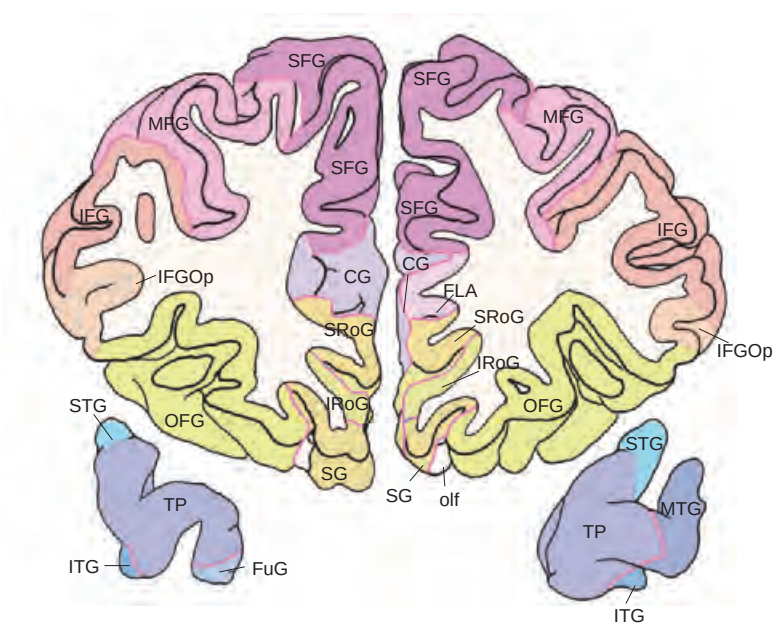


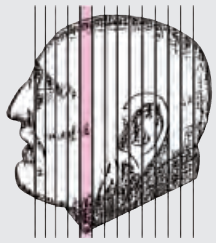






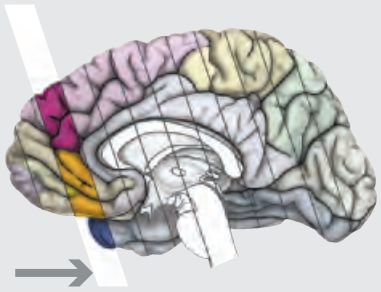






6

(anterior view)



Intracranial structures:

acer	anterior cerebral artery
CG	cingulate gyrus
FLA	frontal limbic area
FuG	fusiform gyrus
FxC	falx cerebri
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
IRoG	inferior rostral gyrus
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OFG	orbitofrontal gyri
olf	olfactory tract
SFG	superior frontal gyrus
SG	straight gyrus
SRoG	superior rostral gyrus
STG	superior temporal gyrus
TP	temporal pole

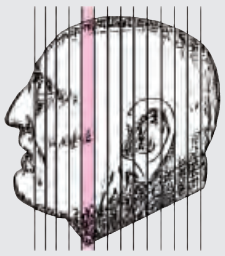
Peripheral structures:

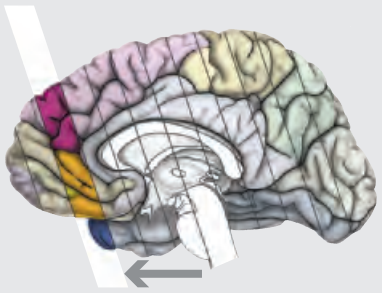
2n	optic nerve
5ial	inferior alveolar nerve
5ior	infraorbital nerve
5lg	lingual nerve
9n	glossopharyngeal nerve
12n	hypoglossal nerve
BFat	buccal fat pad
DigT	digastric muscle, tendon
dpala	descending palatine artery
dta	deep temporal artery
EthC	ethmoidal cell
fac	facial artery
facv	facial vein
HPtg	hamulus of the pterygoid bone
HyGl	hyoglossus muscle
Hyoid	hyoid bone
iala	inferior alveolar artery
iora	infraorbital artery
IRec	inferior rectus muscle
Lg	lingual gland
lga	lingual artery
lgv	lingual vein
LLPt	lateral lamina of pterygoid process
LPal	levator palpebrae superioris muscle
LPtg	lateral pterygoid muscle
LRec	lateral rectus muscle
Man	mandible
ManC	mandibular canal
MasM	masseter muscle
MLPt	medial lamina of pterygoid process
MPtg	medial pterygoid muscle
MRec	medial rectus muscle
mxa	maxillary artery
MxS	maxillary sinus
myhy	mylohyoid nerve
OmHy	omohyoid muscle
opha	ophthalmic artery
ophv	ophthalmic vein
Plat	platysma
pna	posterior nasal artery
ptdd	parotid duct
PtgPal	pterygopalatine ganglion
PtPF	pterygopalatine fossa
shl	stylohyoid ligament
smd	submandibular duct
SM	submandibular gland
SOb	superior oblique muscle
SPal	soft palate
staf	superior temporal a., frontal branch

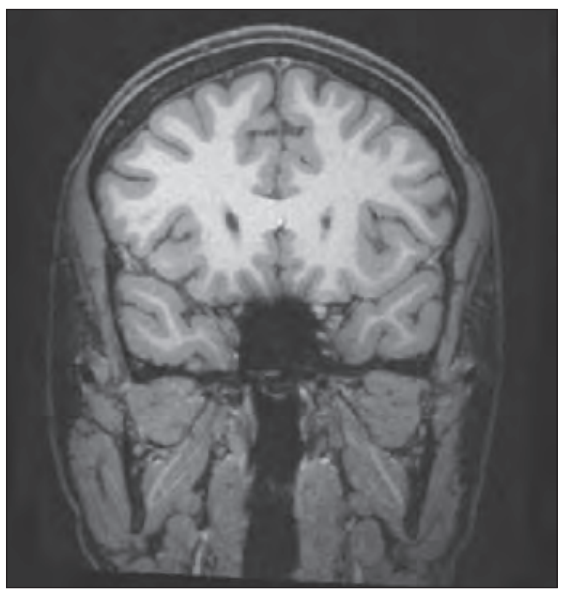
Remainder explained in Index of Abbreviations

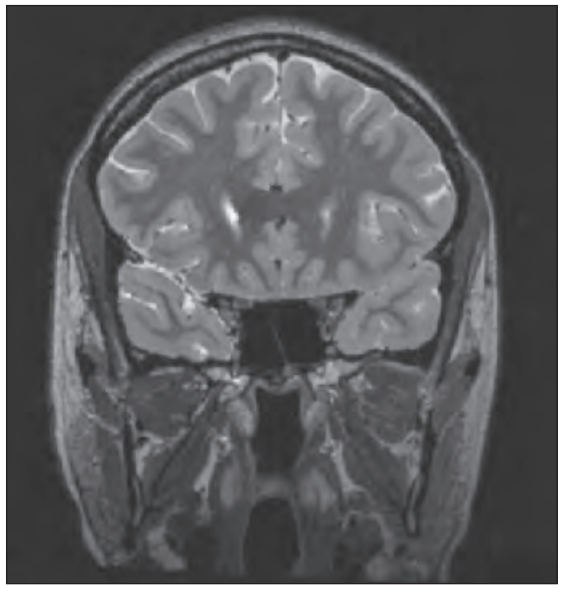
6

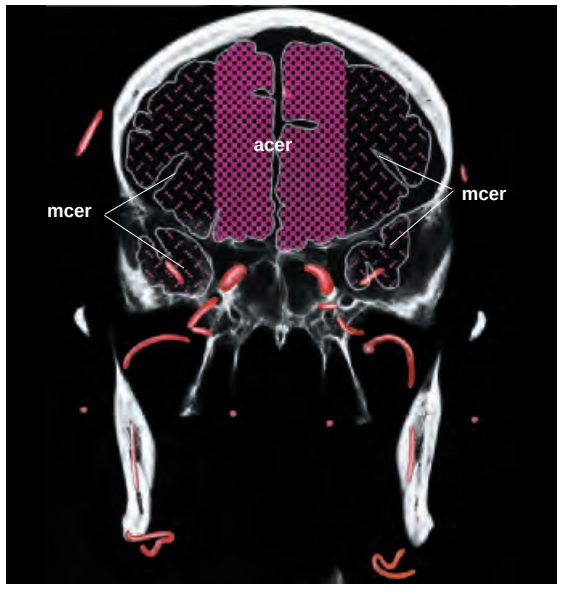
(posterior view)

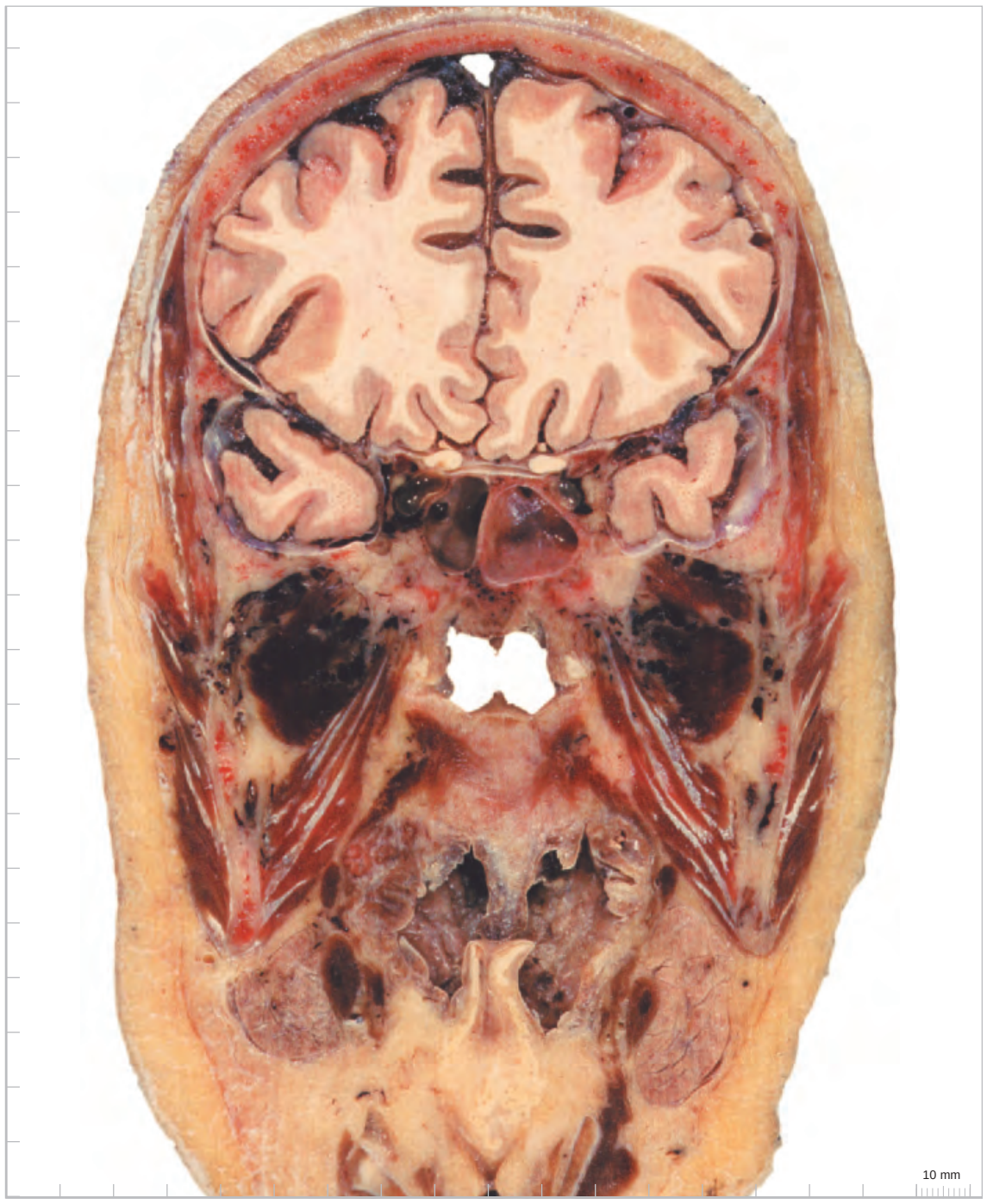


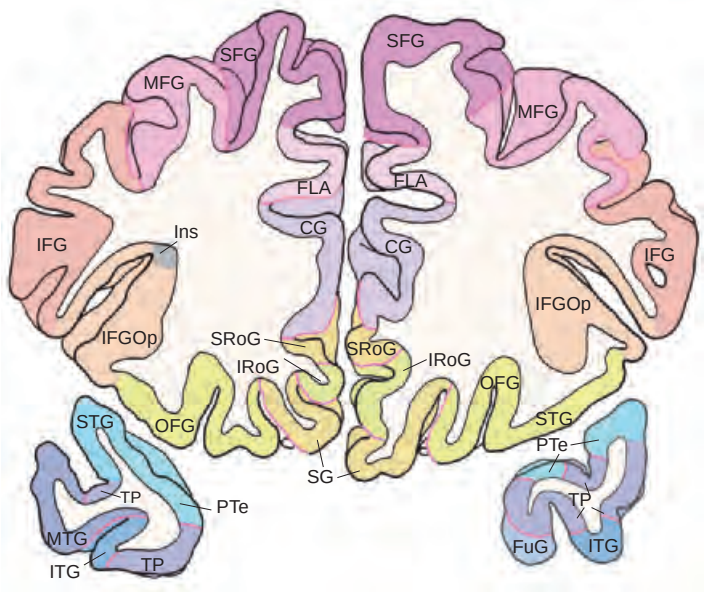


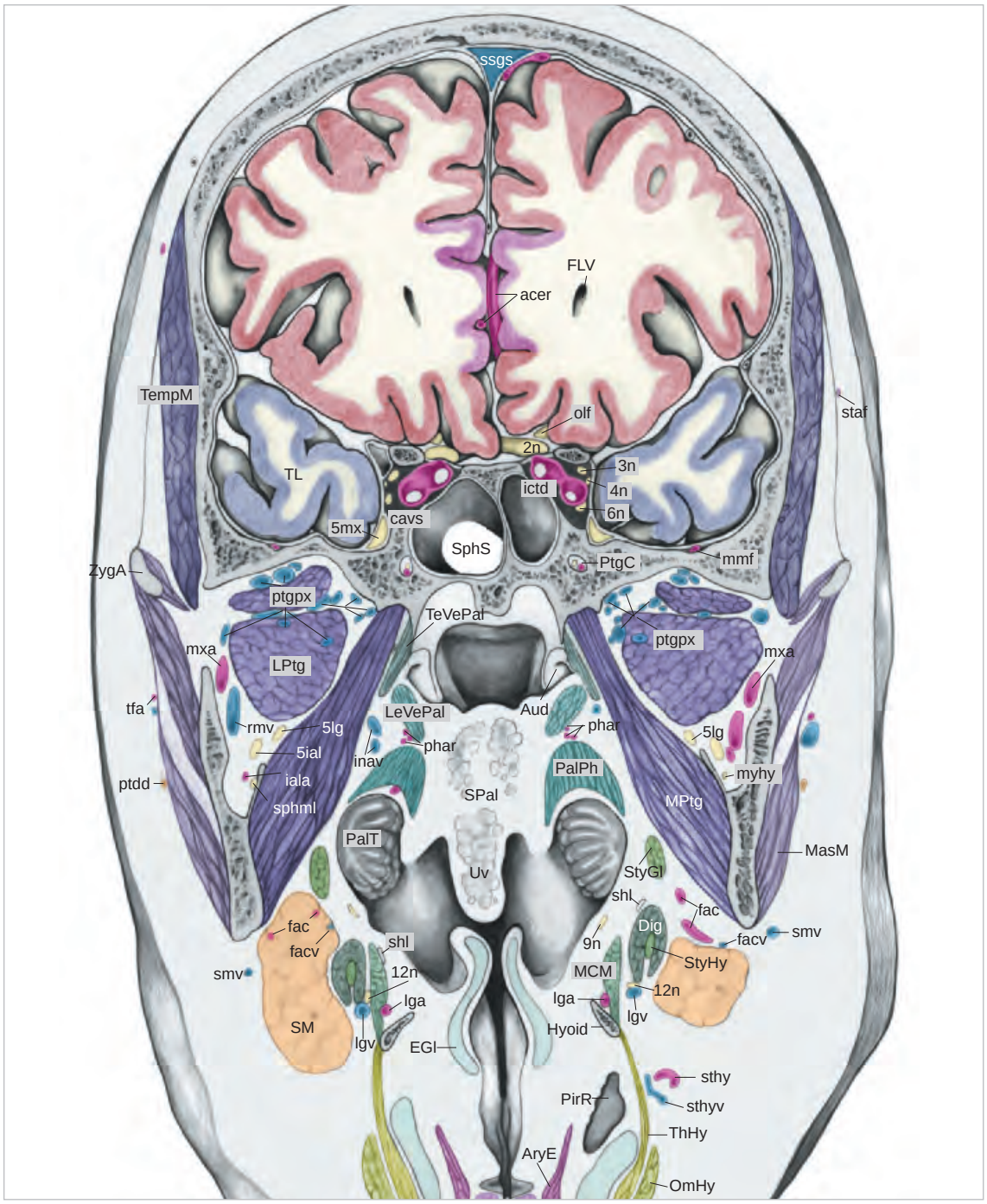


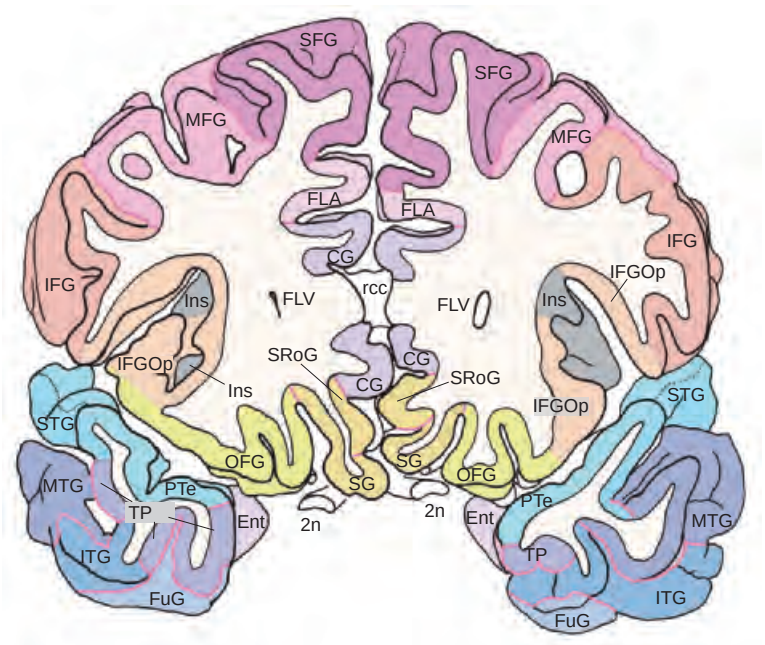


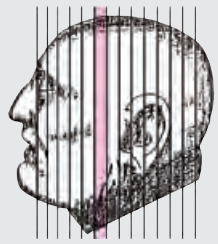






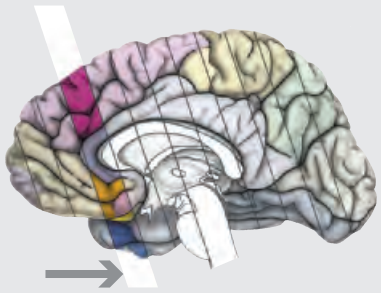






7

(anterior view)



Intracranial structures:

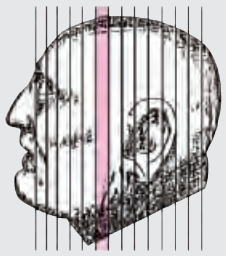
acer	anterior cerebral artery
CG	cingulate gyrus
Ent	entorhinal cortex
FLA	frontal limbic area
FLV	frontal horn of lateral ventricle
FuG	fusiform gyrus
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
IRoG	inferior rostral gyrus
Ins	insula
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OFG	orbitofrontal gyri
PTe	planum temporale
rcc	rostrum of corpus callosum
SFG	superior frontal gyrus
SG	straight gyrus
SRoG	superior rostral gyrus
ssgs	superior sagittal sinus
STG	superior temporal gyrus
TP	temporal pole

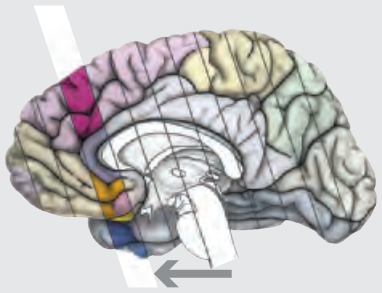
Peripheral structures:

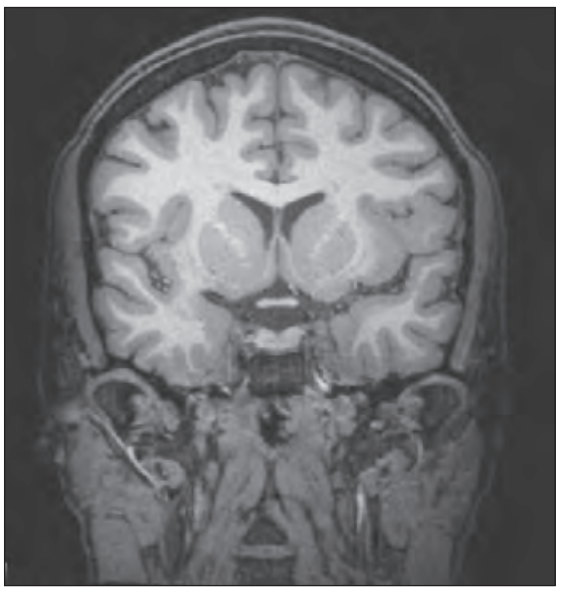
2n	optic nerve
3n	oculomotor nerve
4n	trochlear nerve
5ial	inferior alveolar nerve
5lg	lingual nerve
5mx	maxillary nerve
6n	abducens nerve or its root
9n	glossopharyngeal nerve
12n	hypoglossal nerve
AryE	aryepiglotticus muscle
Aud	auditory tube
cavs	cavernous sinus
Dig	digastric muscle, post belly
EGl	epiglottis
fac	facial artery
facv	facial vein
Hyoid	hyoid bone
iala	inferior alveolar artery
ictd	internal carotid artery
inav	internal nasal vein
lga	lingual artery
lgv	lingual vein
LPtg	lateral pterygoid muscle
LeVePal	levator veli palatini muscle
MasM	masseter muscle
MCM	middle constrictor of the pharynx
mmf	middle meningeal artery, frontal branch
MPtg	medial pterygoid muscle
mxa	maxillary artery
myhy	mylohyoid nerve
OmHy	omohyoid muscle
PalPh	palatopharyngeus muscle
PalT	palatine tonsil
phar	pharyngeal branches
PirR	piriform recess
ptdd	parotid duct
PtgC	pterygoid canal
ptgpx	pterygoid plexus
shl	stylohyoid ligament
SM	submandibular gland
smv	submental vein
sphml	sphenomandibular ligament
staf	superior temporal a., frontal branch
sthy	superior thyroid artery
StyGl	styloglossus muscle

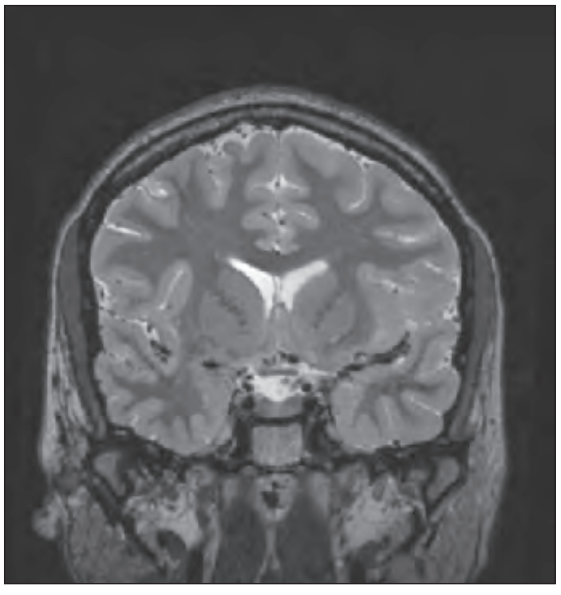
7

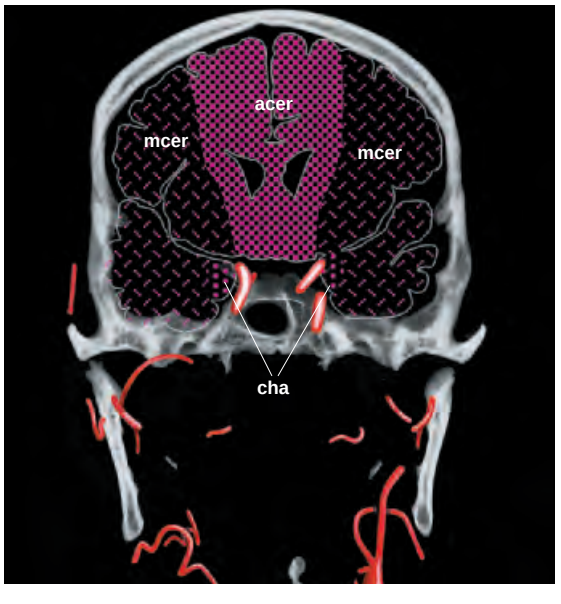
(posterior view)

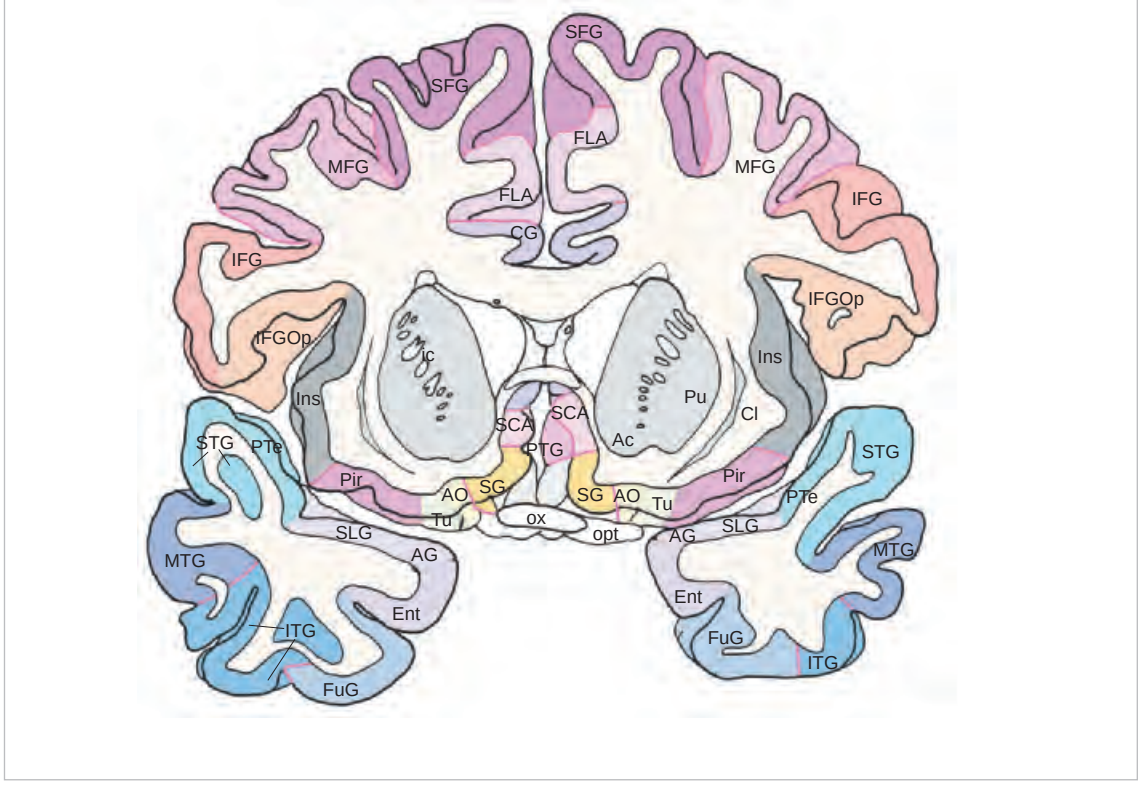


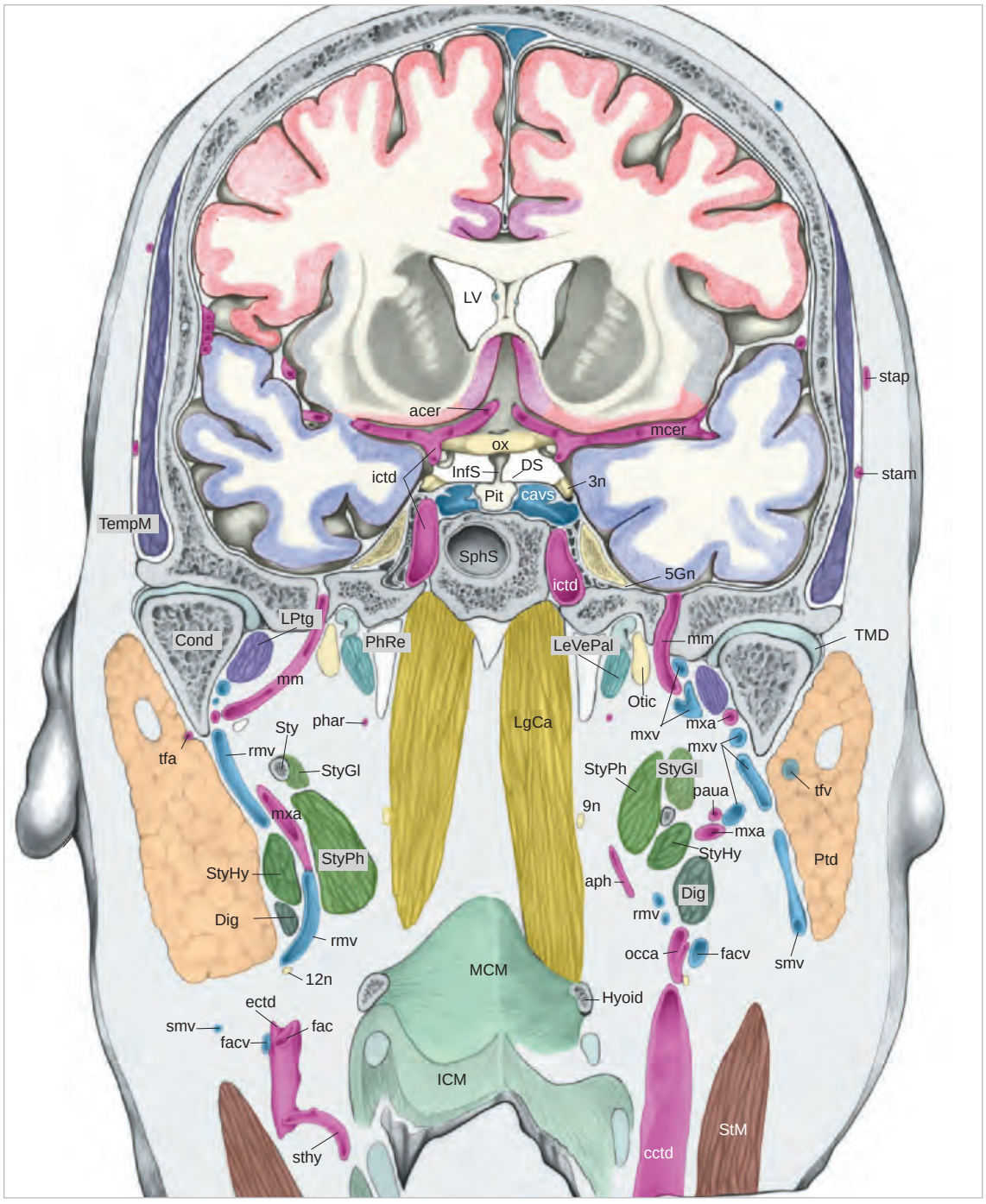


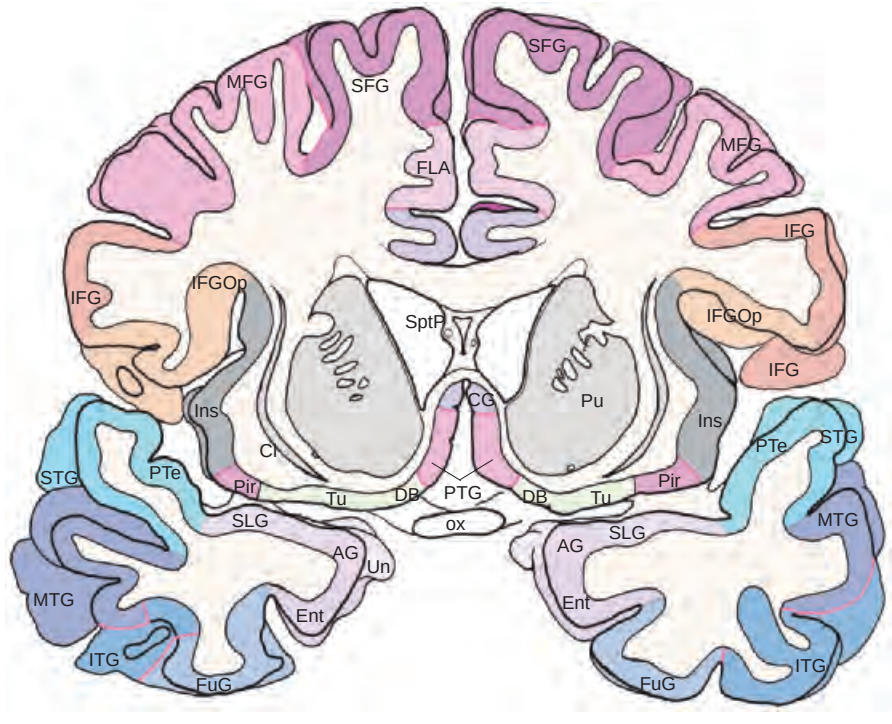


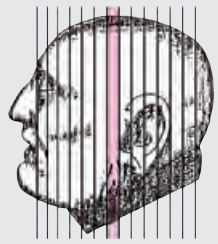






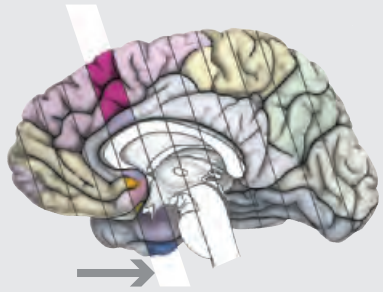






8

(anterior view)



Intracranial structure:

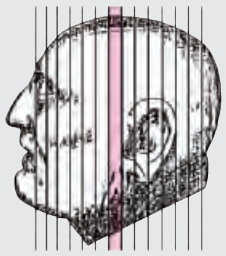
Ac	accumbens nucleus
acer	anterior cerebral artery
AG	ambiens gyrus
AO	anterior olfactory nucleus
CG	cingulate gyrus
cha	anterior choroidal artery
Cl	claustrum
DB	nucleus of the diagonal band
Ent	entorhinal cortex
FLA	frontal limbic area
FuG	fusiform gyrus
ic	internal capsule
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
InfS	infundibular stalk
Ins	insula
ITG	inferior temporal gyrus
LV	lateral ventricle
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
ox	optic chiasm
PTe	planum temporale
Pir	piriform cortex
Pit	pituitary gland
PTG	paraterminal gyrus
Pu	putamen
SCA	subcallosal area
SFG	superior frontal gyrus
SG	straight gyrus
SLG	semilunar gyrus
SptP	septum pellucidum
STG	superior temporal gyrus
Tu	olfactory tubercle
Un	uncus

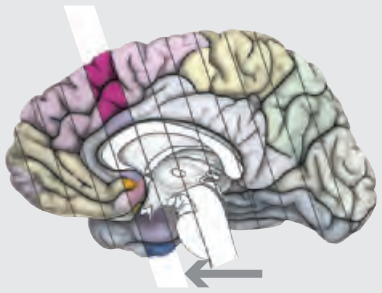
Peripheral structures:

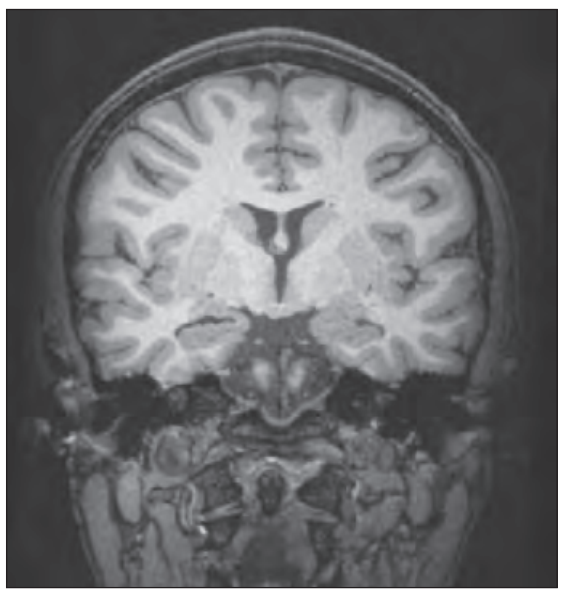
3n	oculomotor nerve
5Gn	trigeminal ganglion
9n	glossopharyngeal nerve
12n	hypoglossal nerve
aph	ascending pharyngeal artery
cavs	cavernous sinus
cctd	common carotid artery
Cond	condylar process of mandible
Dig	digastric muscle, post belly
DS	diaphragma sellae
ectd	external carotid artery
fac	facial artery
facv	facial vein
ICM	inferior constrictor of the pharynx
ictd	internal carotid artery
LgCa	longus capitis muscle
LPtg	lateral pterygoid muscle
LeVePal	levator veli palatini muscle
MCM	middle constrictor of the pharynx
mm	middle meningeal artery
mxa	maxillary artery
mxv	maxillary vein
occa	occipital artery
Otic	otic ganglion
paua	posterior auricular artery
phar	pharyngeal branches
PhRe	pharyngeal recess
Ptd	patotid gland
rmv	retromandibular vein
smv	submental vein
SphS	sphenoid sinus

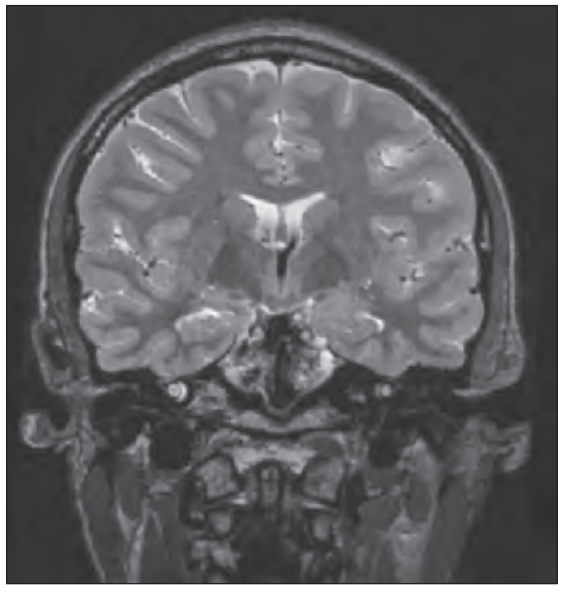
8

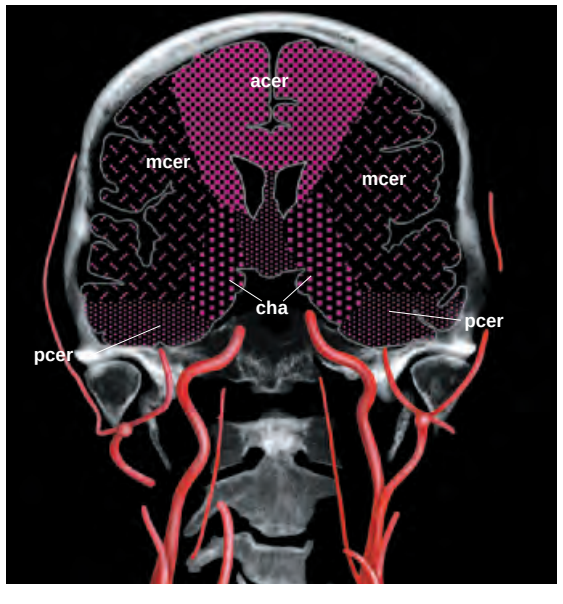
(posterior view)

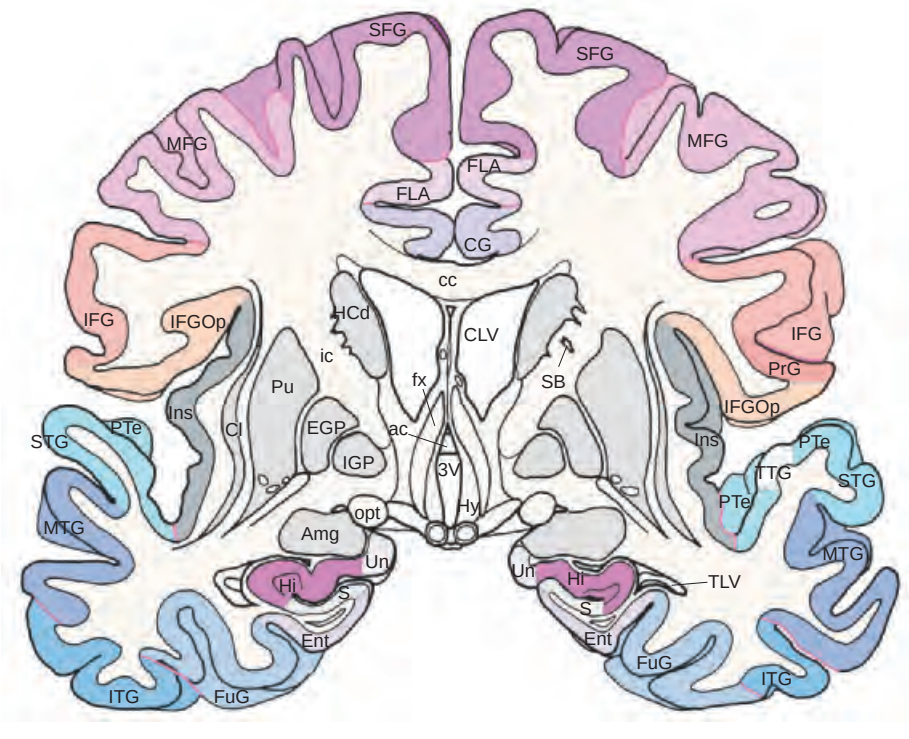


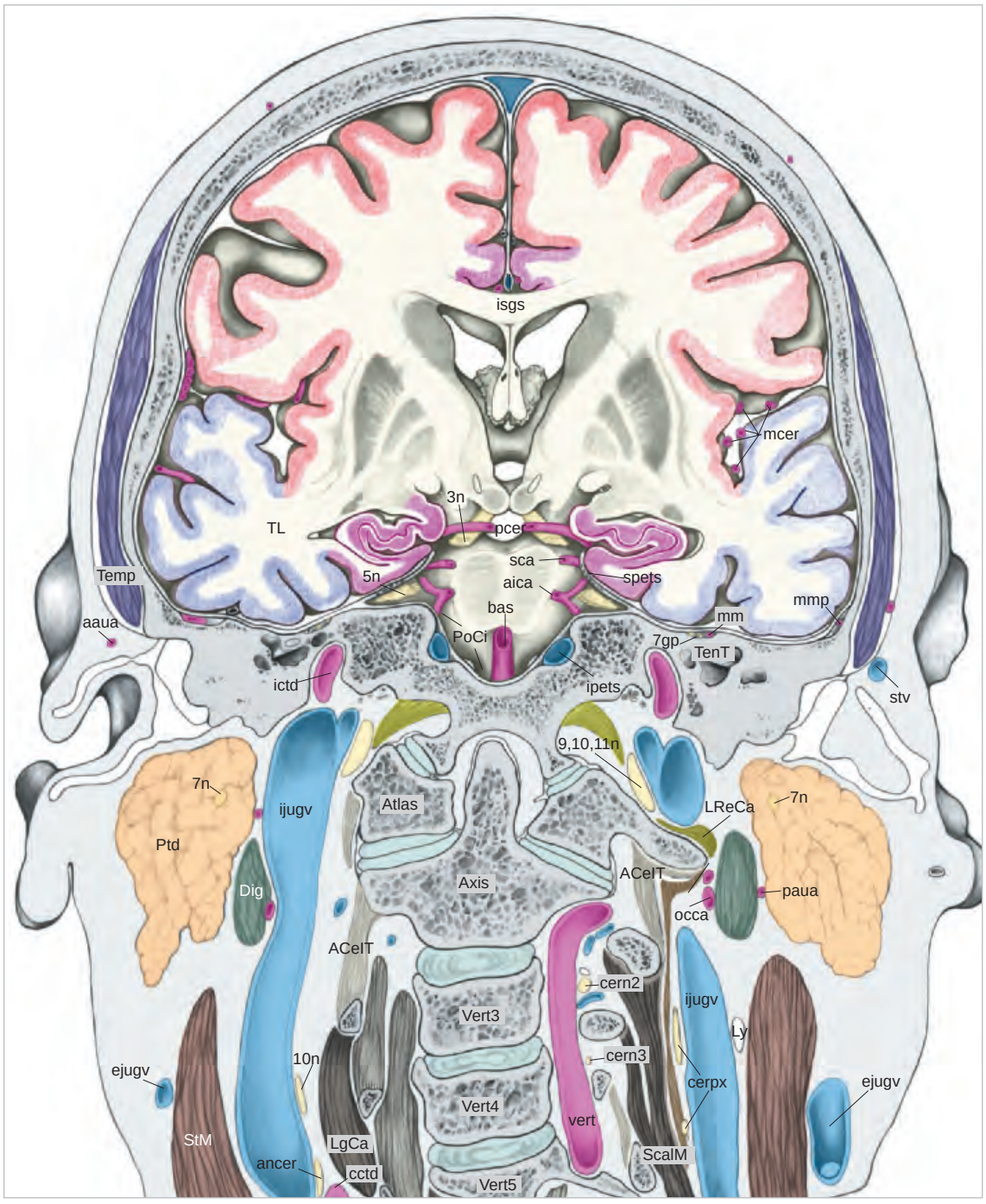


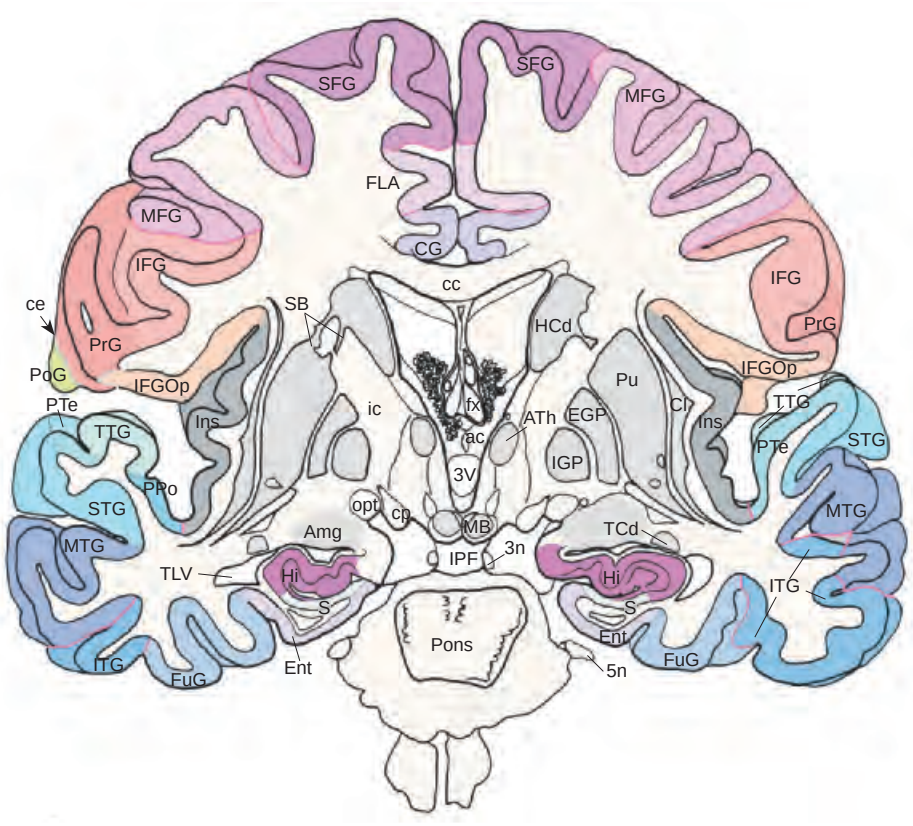


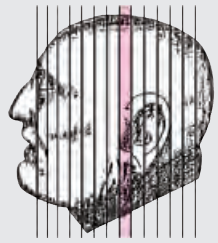






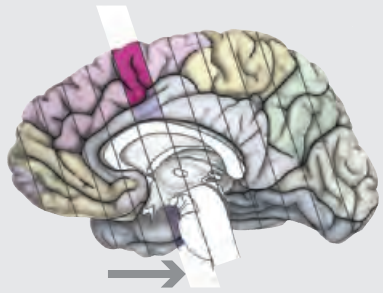






9

(anterior view)



Intracranial structures:

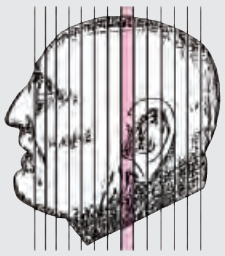
3V	third ventricle
ac	anterior commissure
acer	anterior cerebral artery
Amg	amygdala
ATh	anterior thalamic nucleus
cc	corpus callosum
ce	central fissure
CG	cingulate gyrus
cha	anterior choroidal artery
Cl	claustrum
CLV	central part of lateral ventricle
cp	cerebral peduncle
EGP	external globus pallidus
Ent	entorhinal cortex
FLA	frontal limbic area
FuG	fusiform gyrus
fx	fornix
HCd	head of caudate nucleus
Hi	hippocampus
ic	internal capsule
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
IGP	internal globus pallidus
Ins	insula
ipets	inferior petrosal sinus
IPF	interpeduncular fossa
isgs	inferior sagittal sinus
ITG	inferior temporal gyrus
MB	mammillary body
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
opt	optic tract
pcer	posterior cerebral artery
PoCi	pontine cistern
PoG	postcentral gyrus
PPo	planum polare
PrG	precentral gyrus
PTe	planum temporale
Pu	putamen
S	subiculum
SB	striatal cell bridges
sca	superior cerebellar artery
SFG	superior frontal gyrus
STG	superior temporal gyrus
TCd	tail of caudate nucleus
TL	temporal lobe
TLV	temporal horn of lateral ventricle
TTG	transverse temporal gyri
Un	uncus

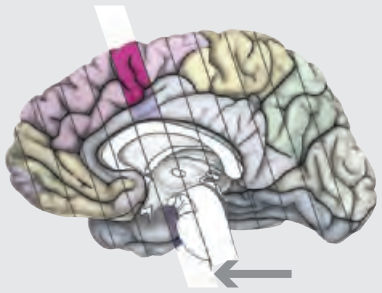
Peripheral structures:

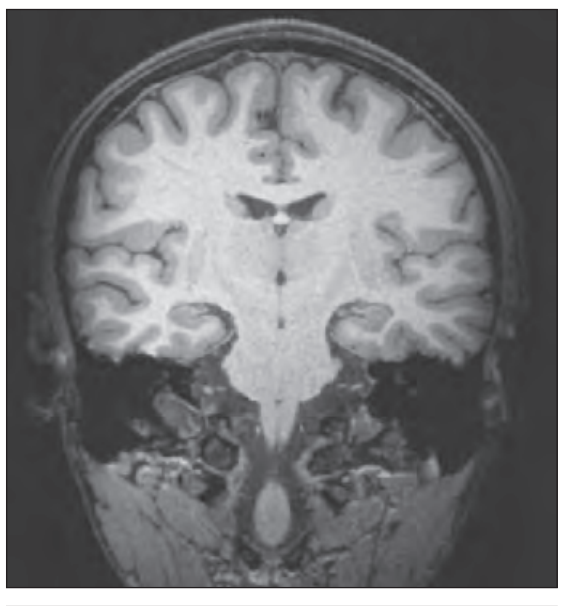
3n	oculomotor nerve or its root
5n	trigeminal nerve
7gp	greater petrosal nerve
7n	facial nerve
9,10,11n	glossopharyngeal, vagus and accessory nerves
aaua	anterior auricular artery
ACeIT	anterior cervical intertransversarii muscles
ancer	ansa cervicalis
cctd	common carotid artery
cern2	cervical nerve 2
cerpx	cervical plexus
ejugv	external jugular vein
Dig	digastric muscle
ictd	internal carotid artery

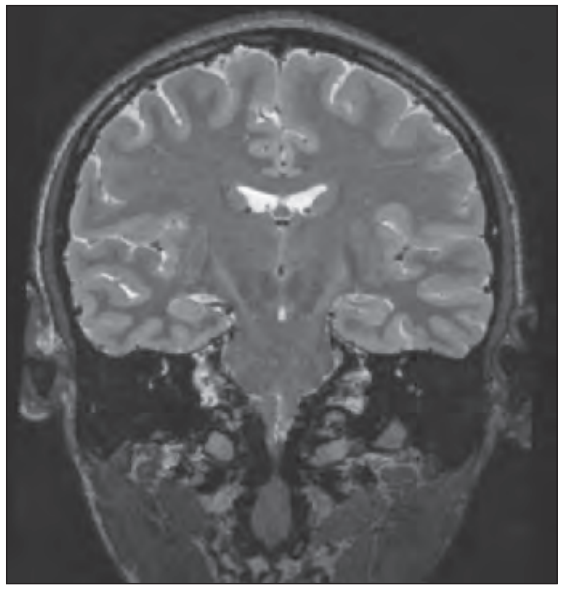
9

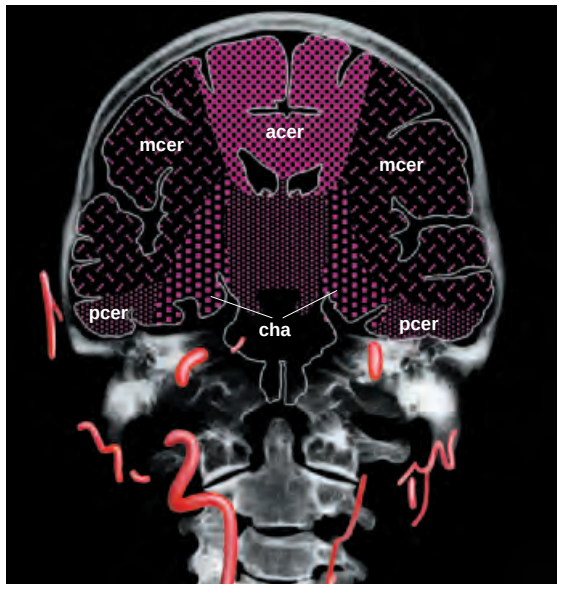
(posterior view)

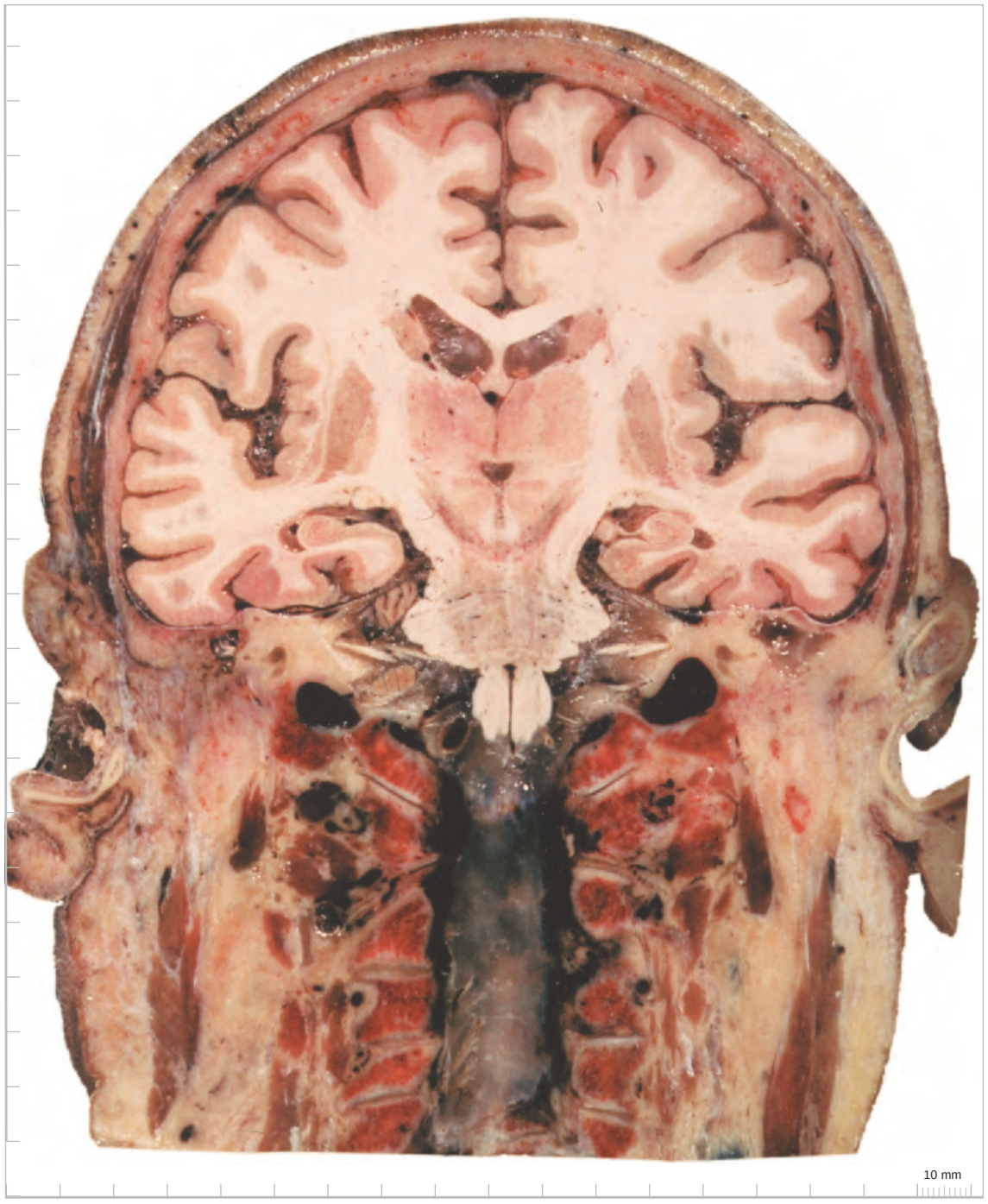


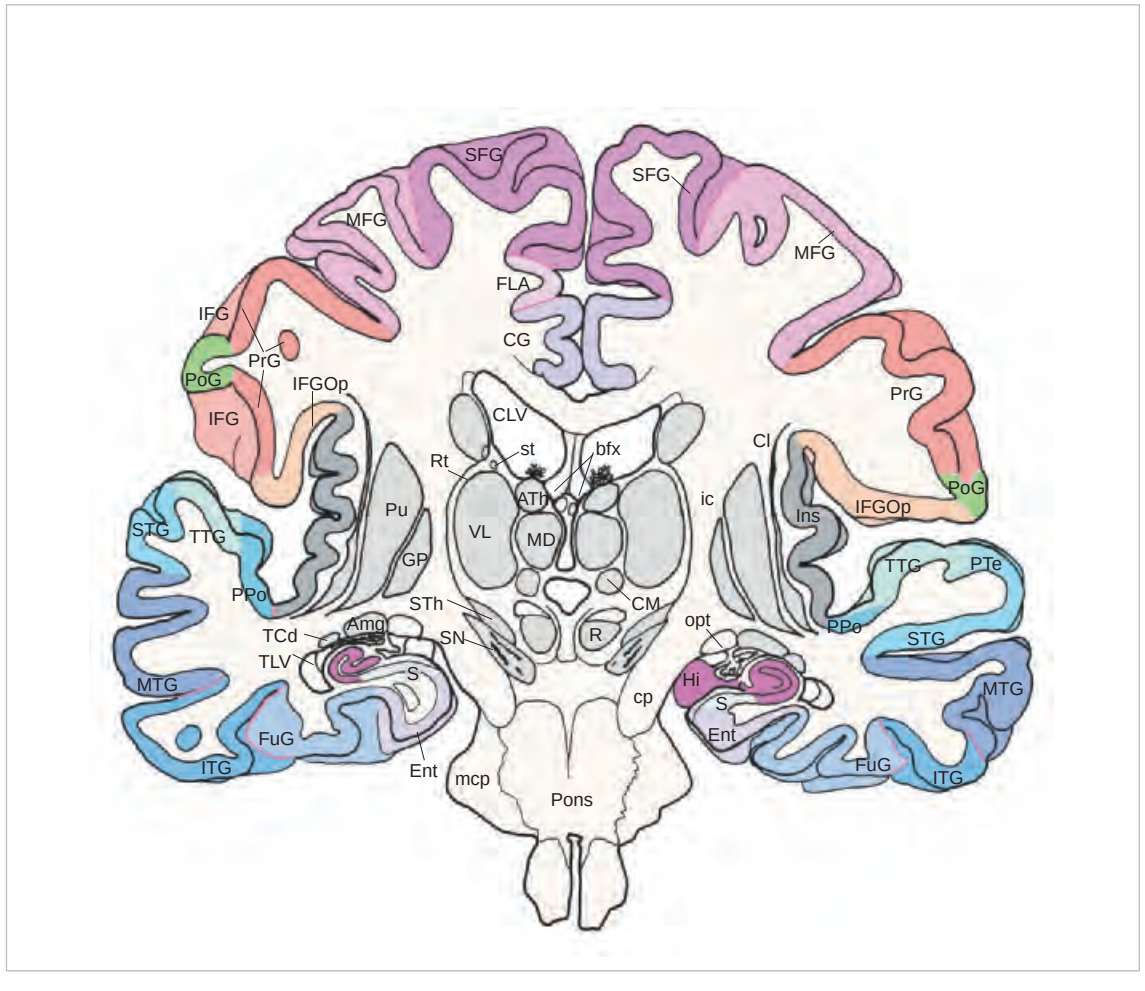


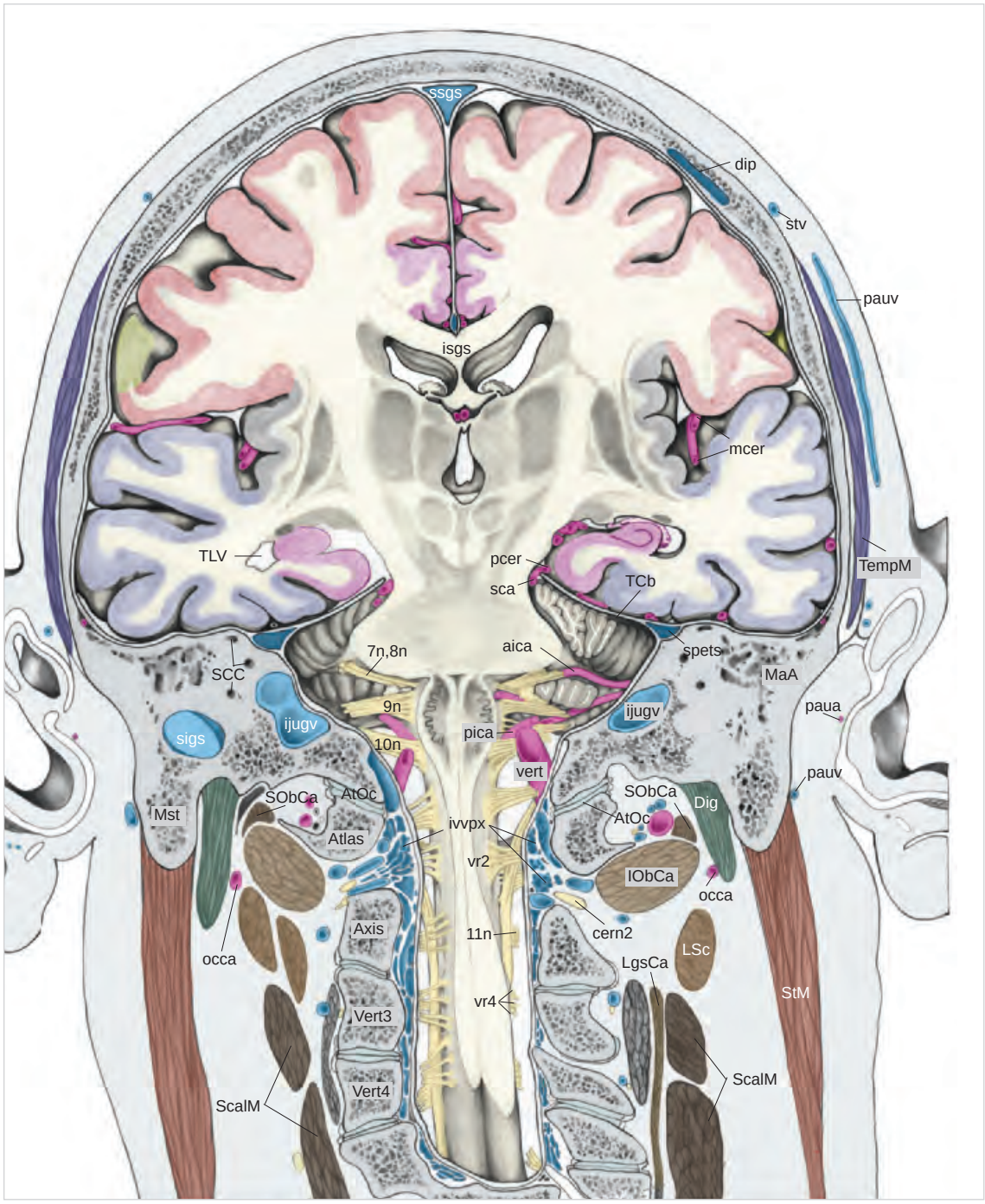


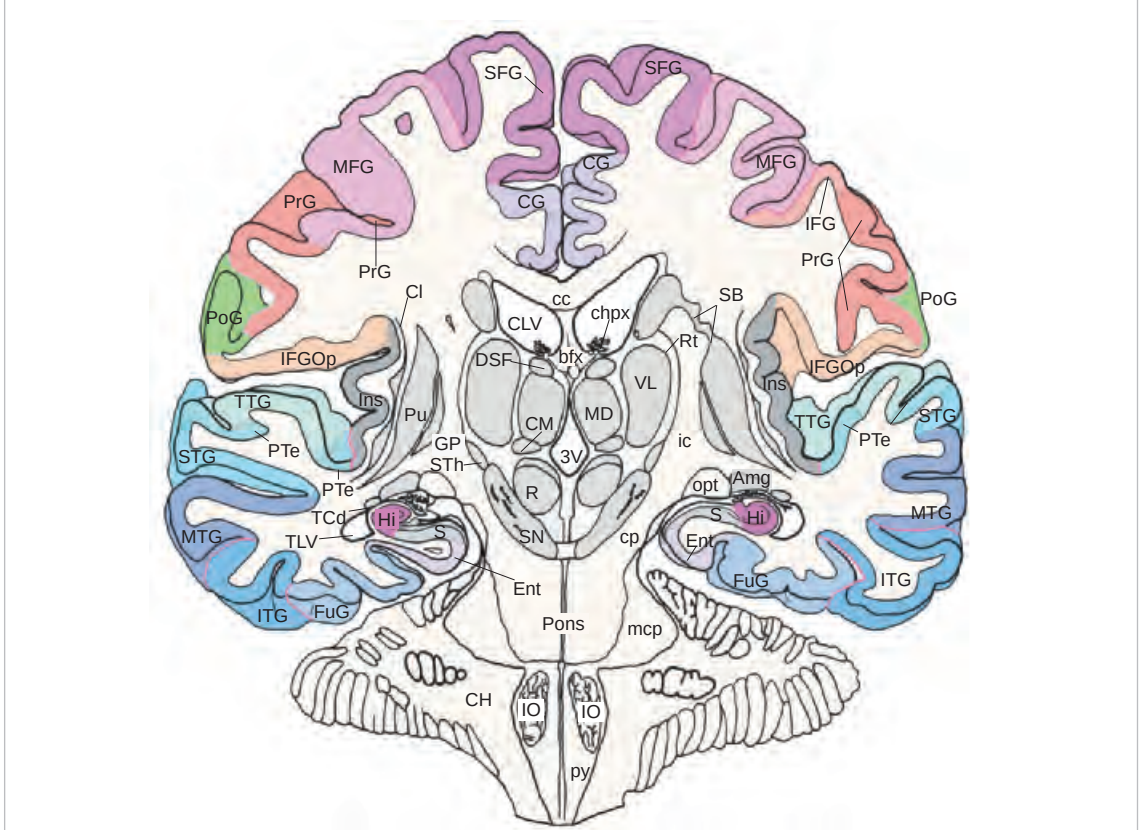


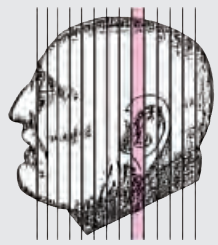






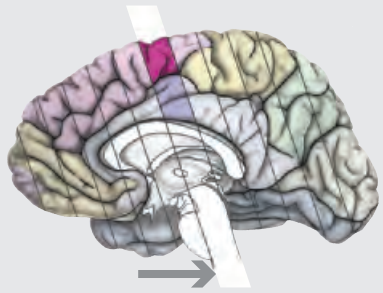






10

(anterior view)



Intracranial structures:

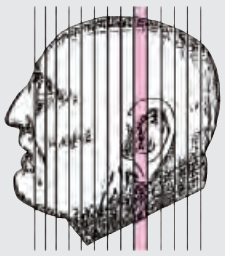
3V	third ventricle
acer	anterior cerebral artery
aica	anterior inferior cerebellar artery
Amg	amygdala
ATh	anterior thalamic nucleus
bfx	body of fornix
cc	corpus callosum
CG	cingulate gyrus
CH	cerebellar hemisphere
cha	anterior choroidal artery
chpx	choroid plexus of the lat. ventricle
Cl	claustrum
CLV	central part of lateral ventricle
CM	centromedian thalamic nucleus
cp	cerebral peduncle
dip	diploic vein
DSF	dorsal superficial nucleus
Ent	entorhinal cortex
FLA	frontal limbic area
FuG	fusiform gyrus
GP	globus pallidus
Hi	hippocampus
ic	internal capsule
IFG	inferior frontal gyrus
IFGOp	inferior frontal gyrus, opercular part
Ins	insula
IO	inferior olive
isgs	inferior sagittal sinus
ITG	inferior temporal gyrus
mcer	middle cerebral artery
mcp	middle cerebellar peduncle
MD	mediodorsal thalamic nucleus
MFG	middle frontal gyrus
MTG	middle temporal gyrus
opt	optic tract
pcer	posterior cerebral artery
pica	posterior inferior cerebellar artery
PoG	postcentral gyrus
PPo	planum polare
PrG	precentral gyrus
PTe	planum temporale
Pu	putamen
py	pyramidal tract
R	red nucleus
Rt	reticular thalamic nucleus
S	subiculum
SB	striatal cell bridges
sca	superior cerebellar artery
SCC	semicircular canals
SFG	superior frontal gyrus
sigs	sigmoid sinus
SN	substantia nigra
spets	superior petrosal sinus
ssgs	superior sagittal sinus
STG	superior temporal gyrus
STh	subthalamic nucleus
TCb	tentorium cerebelli
TCd	tail of caudate nucleus
TLV	temporal horn of lateral ventricle
TTG	transverse temporal gyrus
vert	vertebral artery
VL	ventral lateral thalamic nucleus

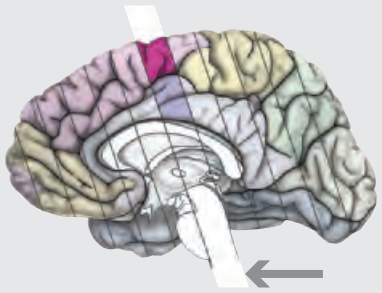
Peripheral structures:

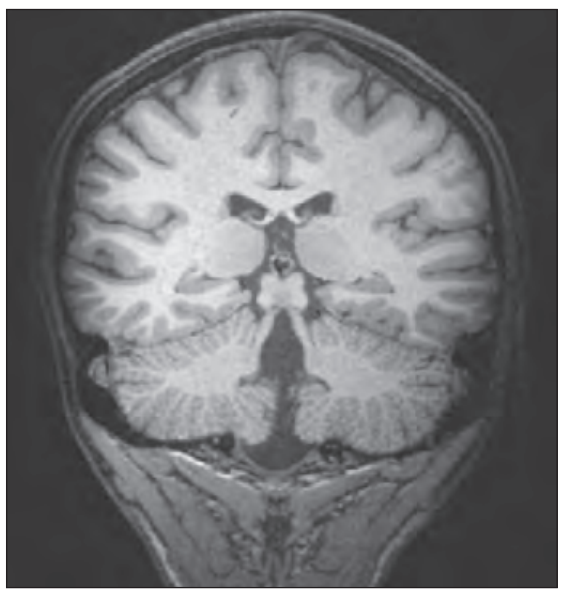
AtOc	atlanto-occipital joint
ijugv	internal jugular vein, bulbus
vr	ventral root

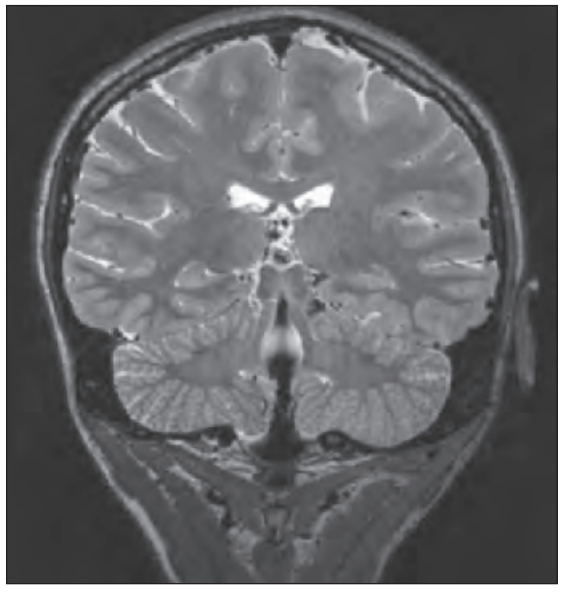
10

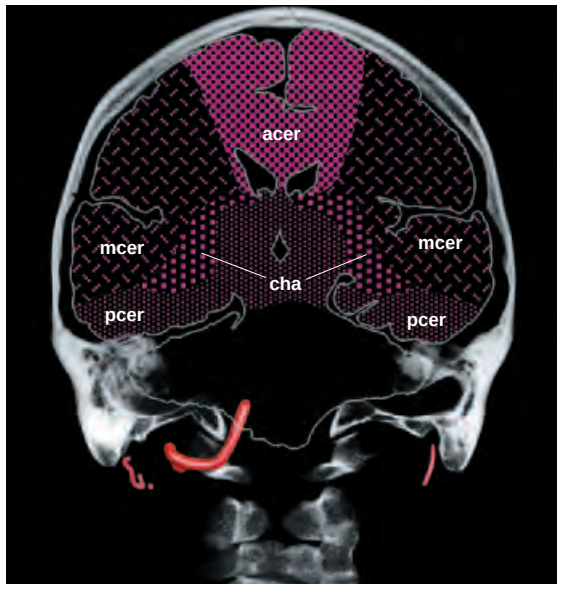
(posterior view)

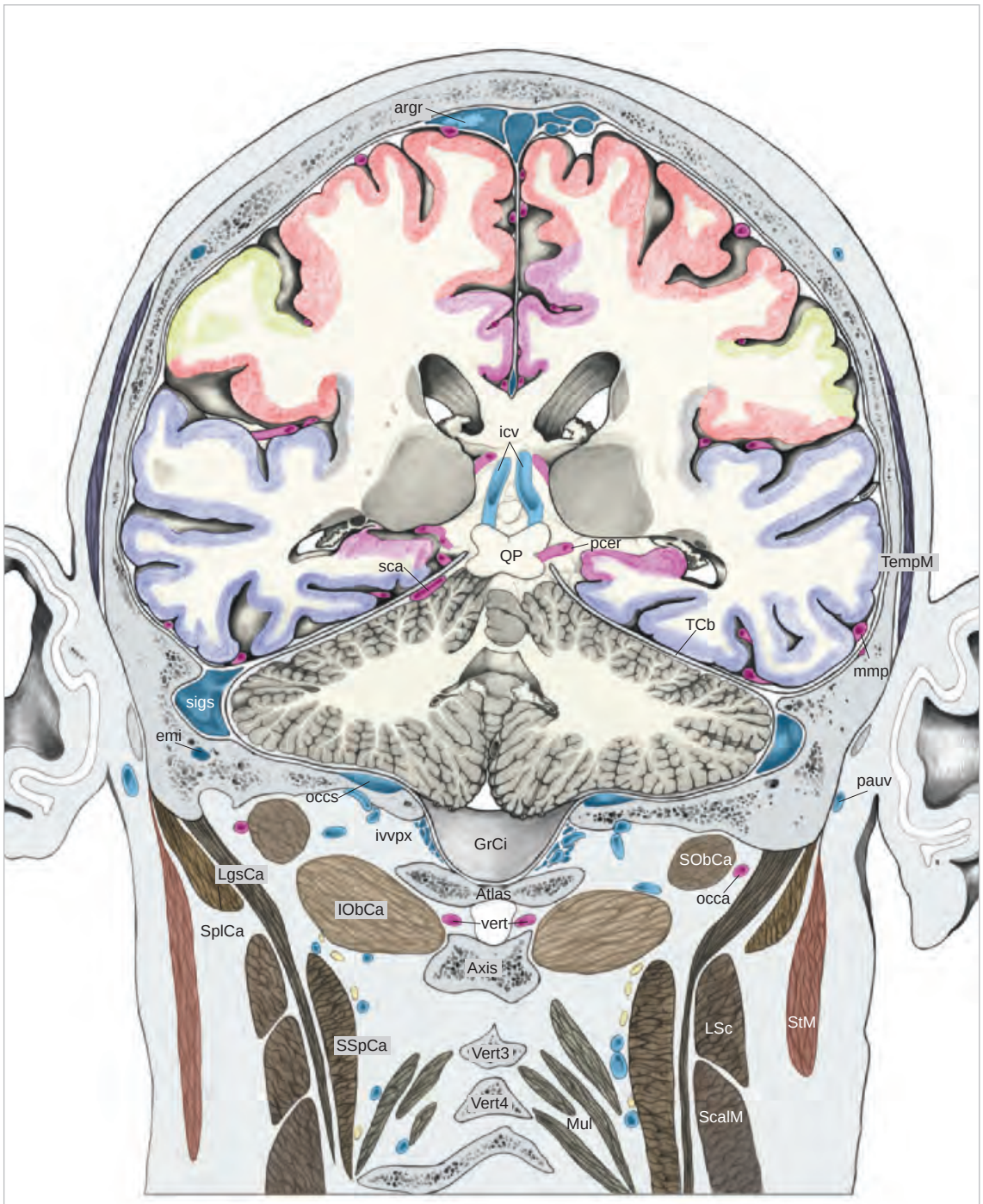


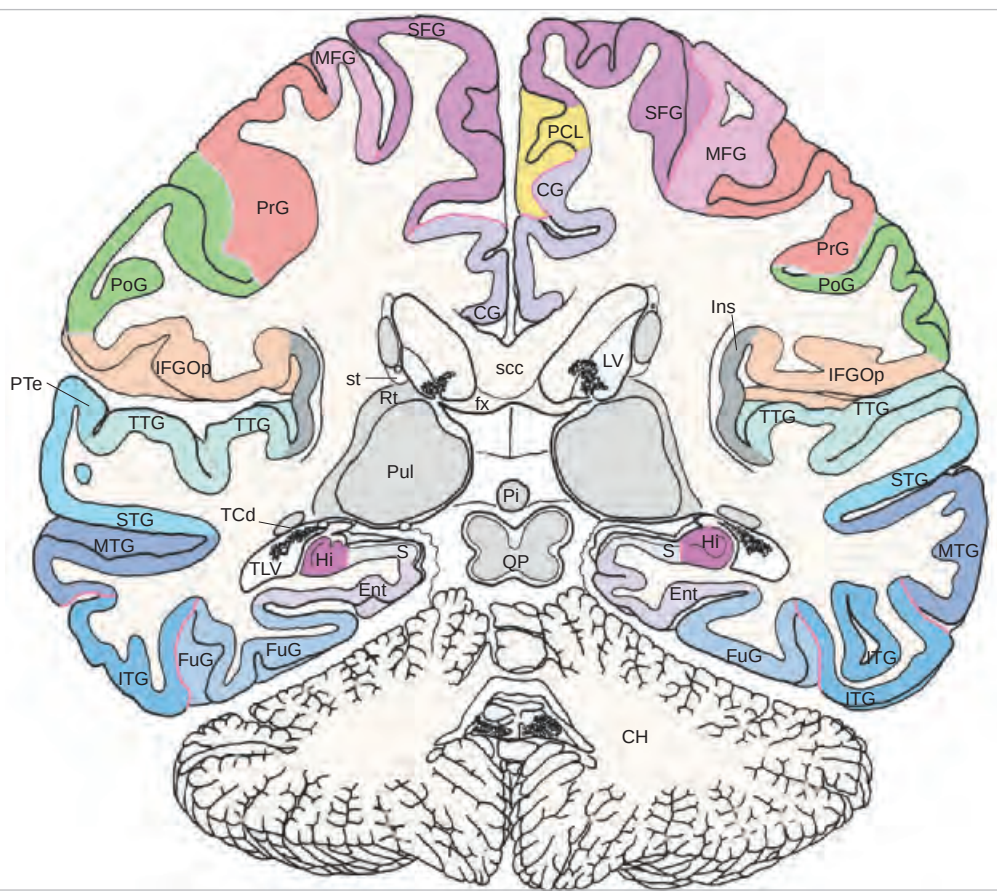


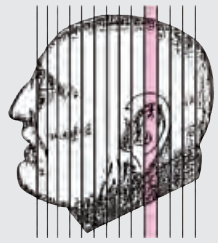






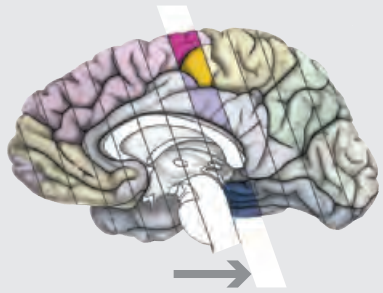






11

(anterior view)



Intracranial structures:

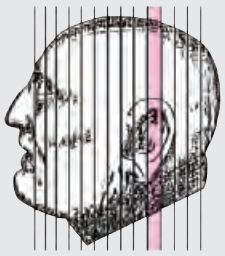
3V	third ventricle
4V	fourth ventricle
acer	anterior cerebral artery
argr	arachnoid granulations
BCd	body of caudate nucleus
bfx	body of fornix
cc	corpus callosum
CG	cingulate gyrus
CH	cerebellar hemisphere
cha	anterior choroidal artery
Ent	entorhinal cortex
FuG	fusiform gyrus
fx	fornix
GrCi	great (cerebellomedullary) cistern
Hi	hippocampus
icv	internal cerebral vein
IFGOp	inferior frontal gyrus, opercular part
Ins	insula
ITG	inferior temporal gyrus
LV	lateral ventricle
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
occs	occipital sinus
OcG	occipital gyri
pcer	posterior cerebral artery
PCL	paracentral lobule
Pi	pineal gland
PoG	postcentral gyrus
PrG	precentral gyrus
PTe	planum temporale
Pul	pulvinar thalami
QP	quadrigeminal plate
Rt	reticular thalamic nucleus
S	subiculum
SB	striatal cell bridges
sca	superior cerebellar artery
scc	splenium of the corpus callosum
SFG	superior frontal gyrus
scp	superior cerebellar peduncle
sigs	sigmoid sinus
SMV	superior medullary velum
st	stria terminalis
STG	superior temporal gyrus
TCb	tentorium cerebelli
TCd	tail of caudate nucleus
Tec	tectum of midbrain
TLV	temporal horn of lateral ventricle
tsv	thalamostriate vein
TTG	transverse temporal gyrus
Ver	vermis of cerebellum

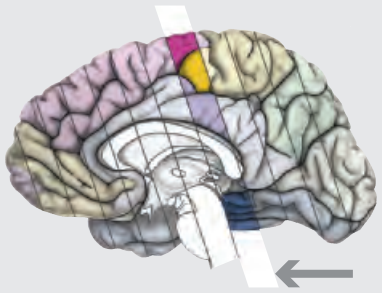
Peripheral structures:

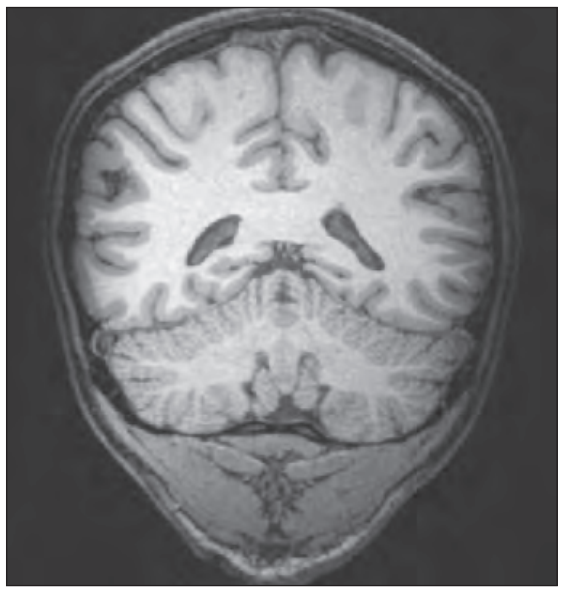
Atlas	atlas
Axis	axis
emi	emissary vein
IObCa	inferior oblique capitis muscle
ivvpx	internal vertebral venous plexus
LgsCa	longissimus capitis muscle
LSc	levator scapulae muscle
mmp	middle meningeal artery, parietal branch
Mul	multifidus muscle
occa	occipital artery
pauv	posterior auricular vein
ScalM	scalenus muscle
SObCa	superior oblique capitis muscle
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
StM	sternomastoid muscle

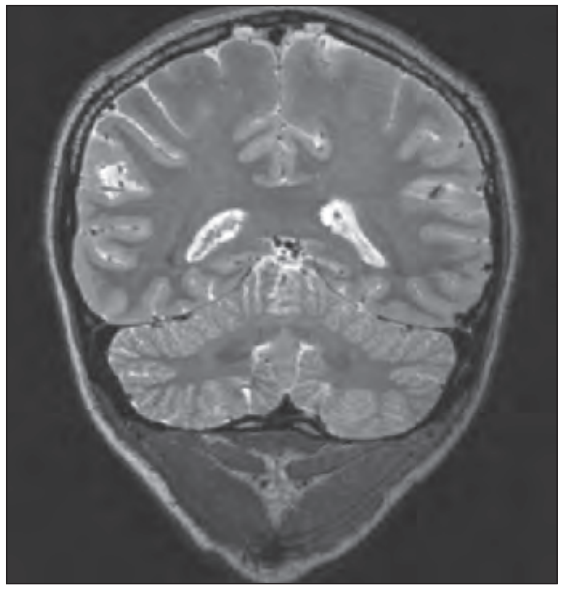
11

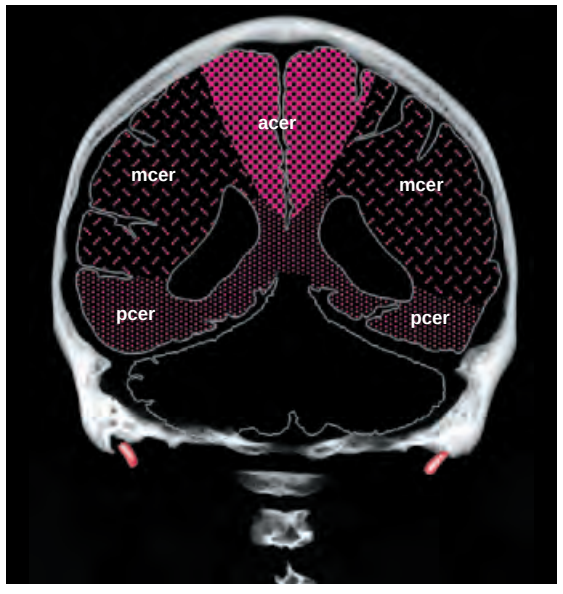
(posterior view)

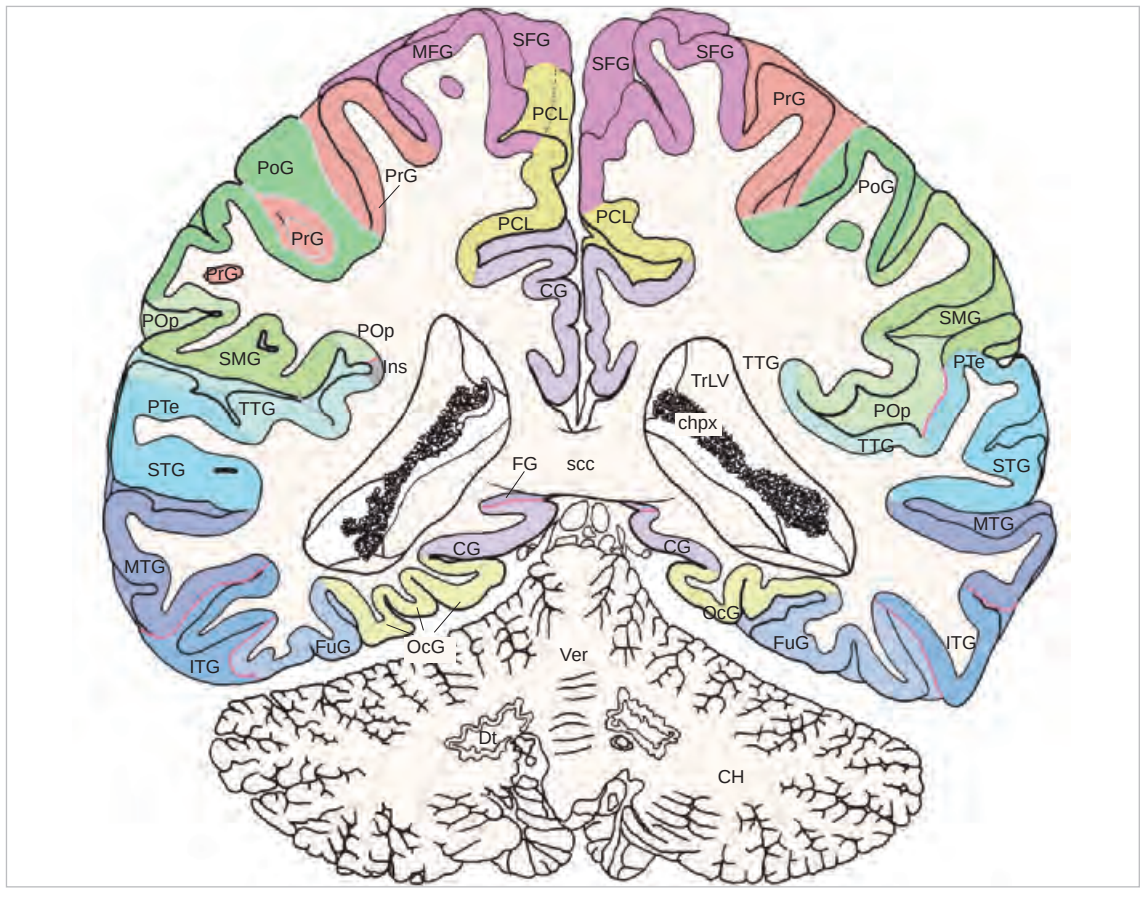


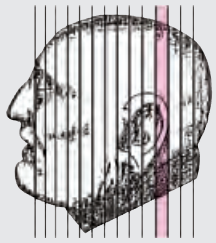






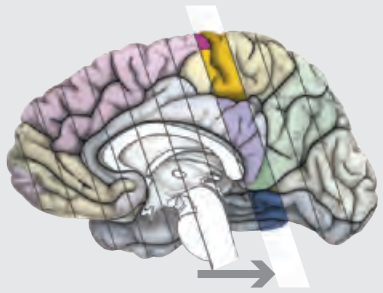


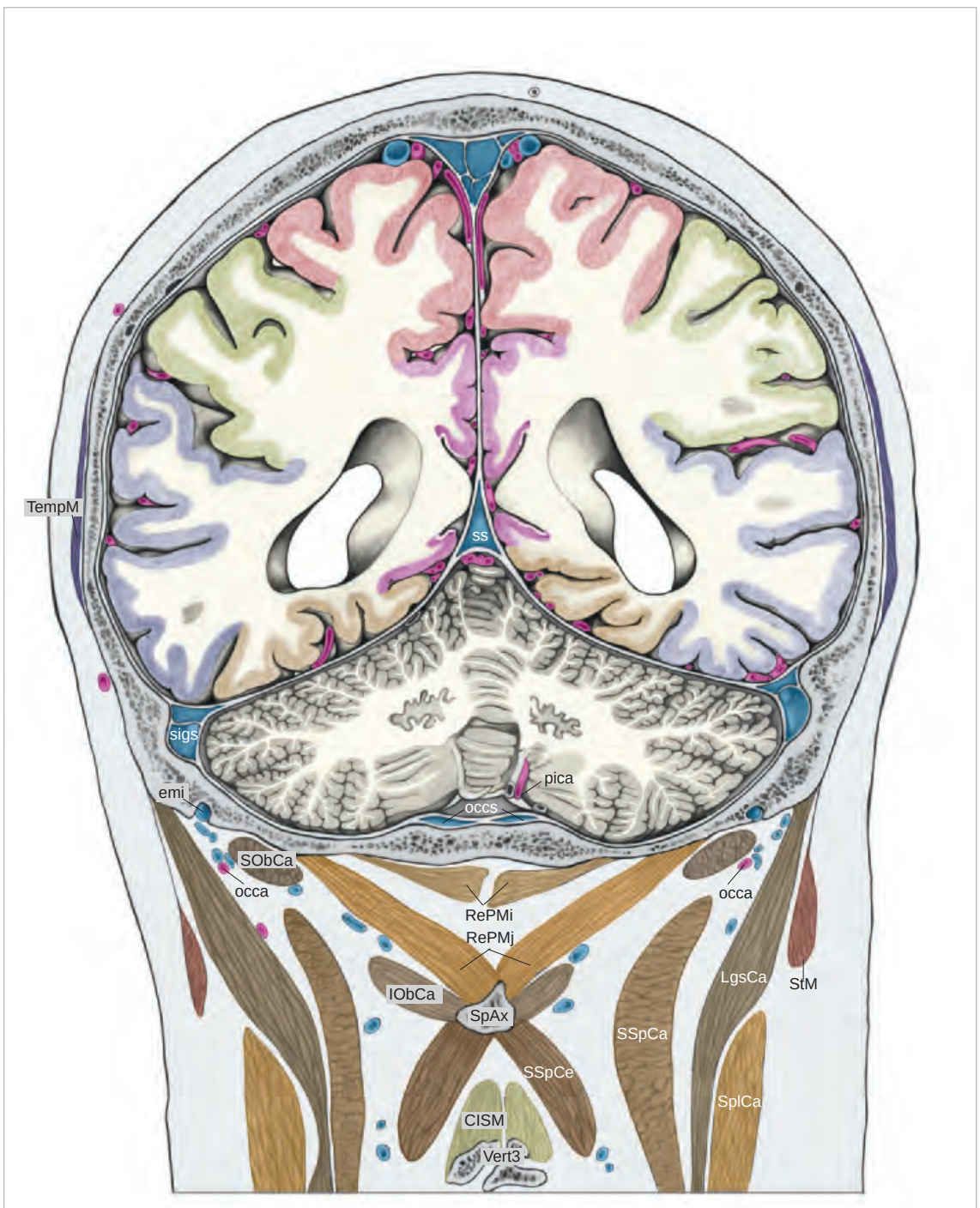


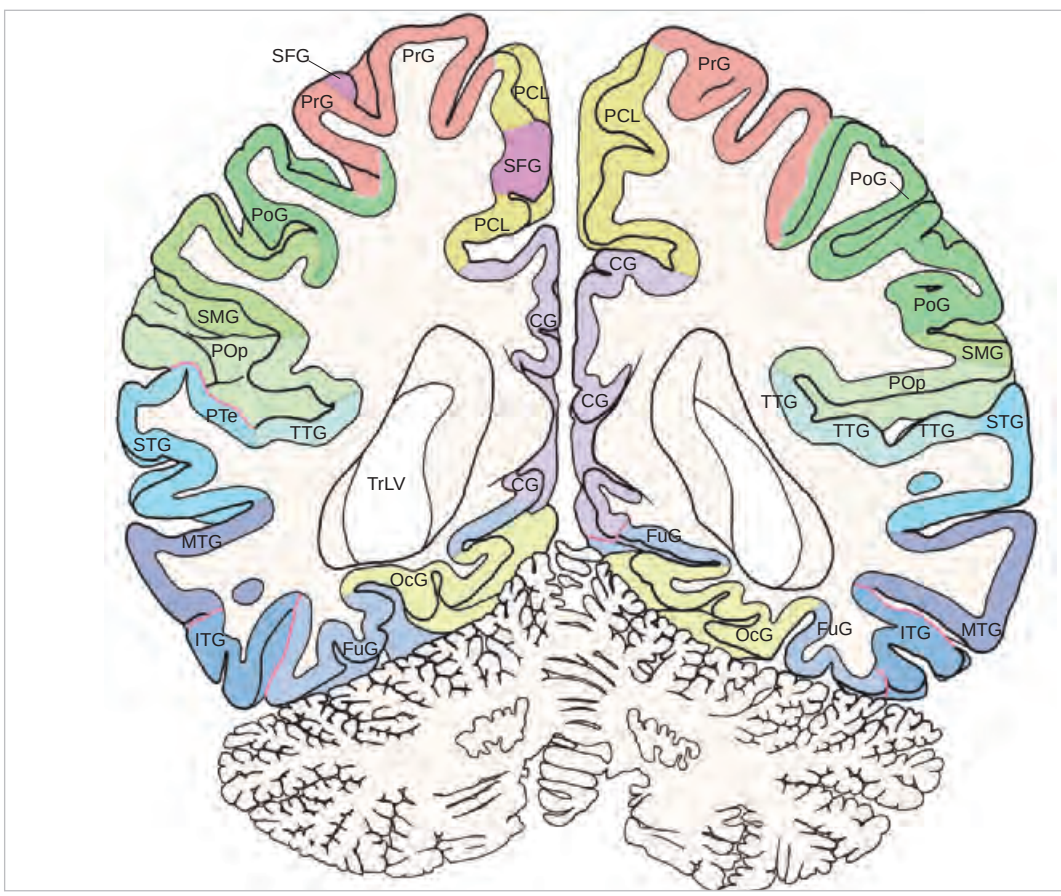


12

(anterior view)







Intracranial structures:

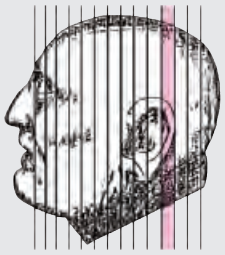
acer	anterior cerebral artery
CG	cingulate gyrus
CH	cerebellar hemisphere
chpx	choroid plexus of the lat. ventricle
Dt	dentate nucleus
FG	fasciolar gyrus
FuG	fusiform gyrus
Ins	insula
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
occs	occipital sinus
OcG	occipital gyri
pcer	posterior cerebral artery
PCL	paracentral lobule
pica	posterior inferior cerebellar artery
PoG	postcentral gyrus
POp	parietal operculum
PrG	precentral gyrus
PTe	planum temporale
scc	splenium of the corpus callosum
SFG	superior frontal gyrus
sigs	sigmoid sinus
SMG	supramarginal gyrus
ss	straight sinus
STG	superior temporal gyrus
TrLV	trigone of lateral ventricle
TTG	transverse temporal gyrus
Ver	vermis of cerebellum

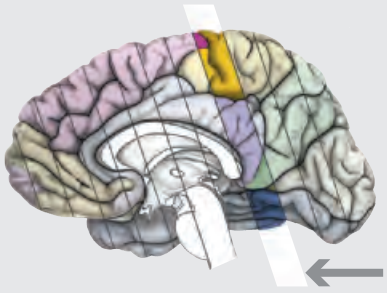
Peripheral structures:

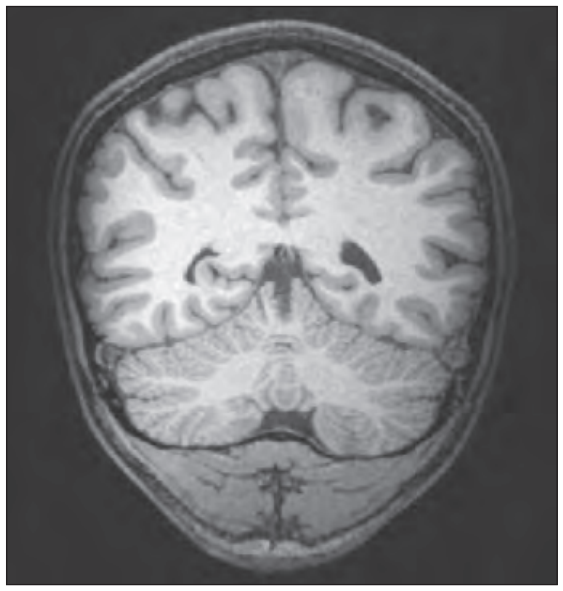
CISM	cervical interspinal muscle
emi	emissary vein
IObCa	inferior oblique capitis muscle
LgsCa	longissimus capitis muscle
occa	occipital artery
RePMi	rectus capitis post. minor muscle
RePMj	rectus capitis post. major muscle
SObCa	superior oblique capitis muscle
SpAx	spinous process of axis
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
SSpCe	semispinalis cervicis muscle
StM	sternomastoid muscle
TempM	temporalis muscle
Vert3	third vertebra

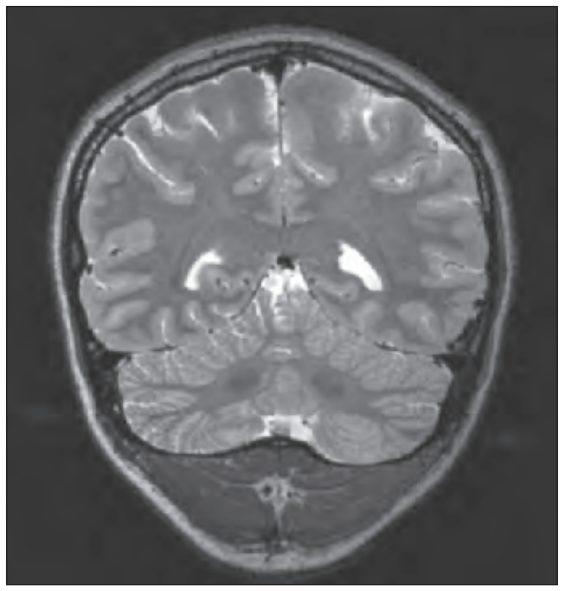
12

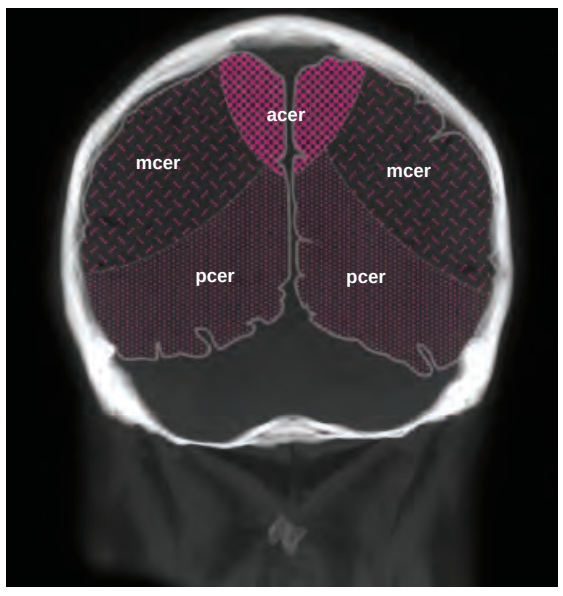
(posterior view)











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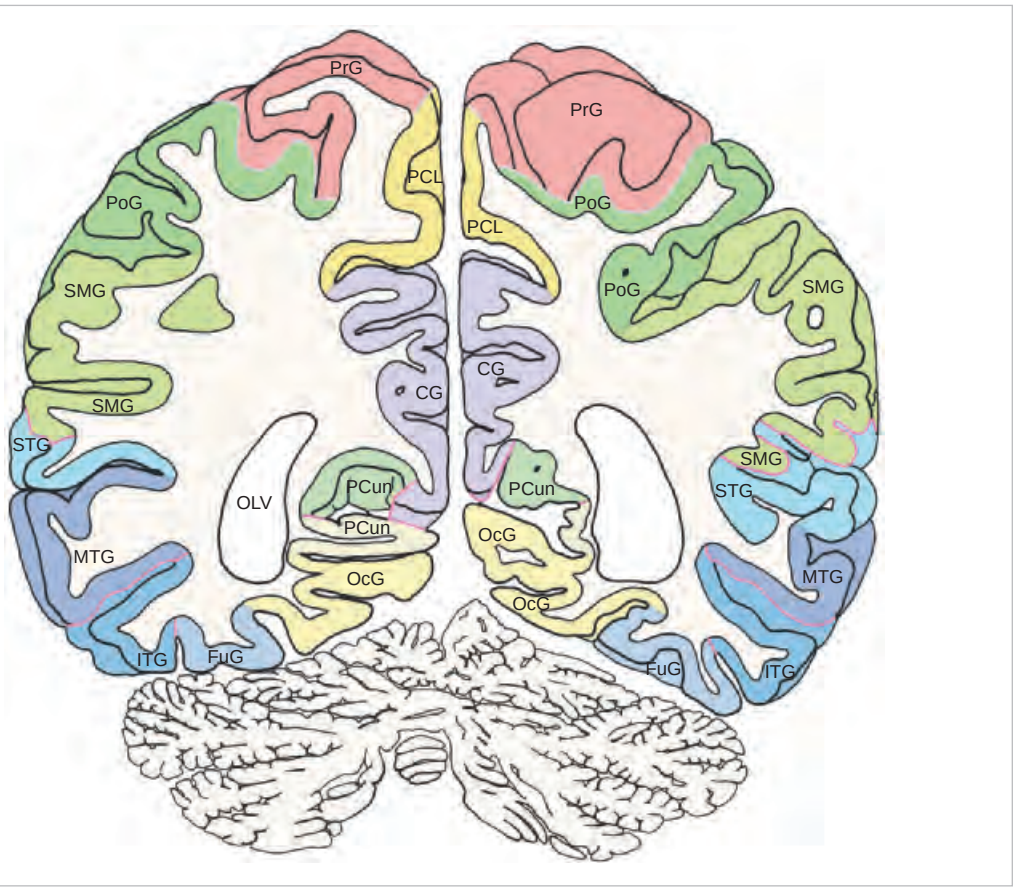
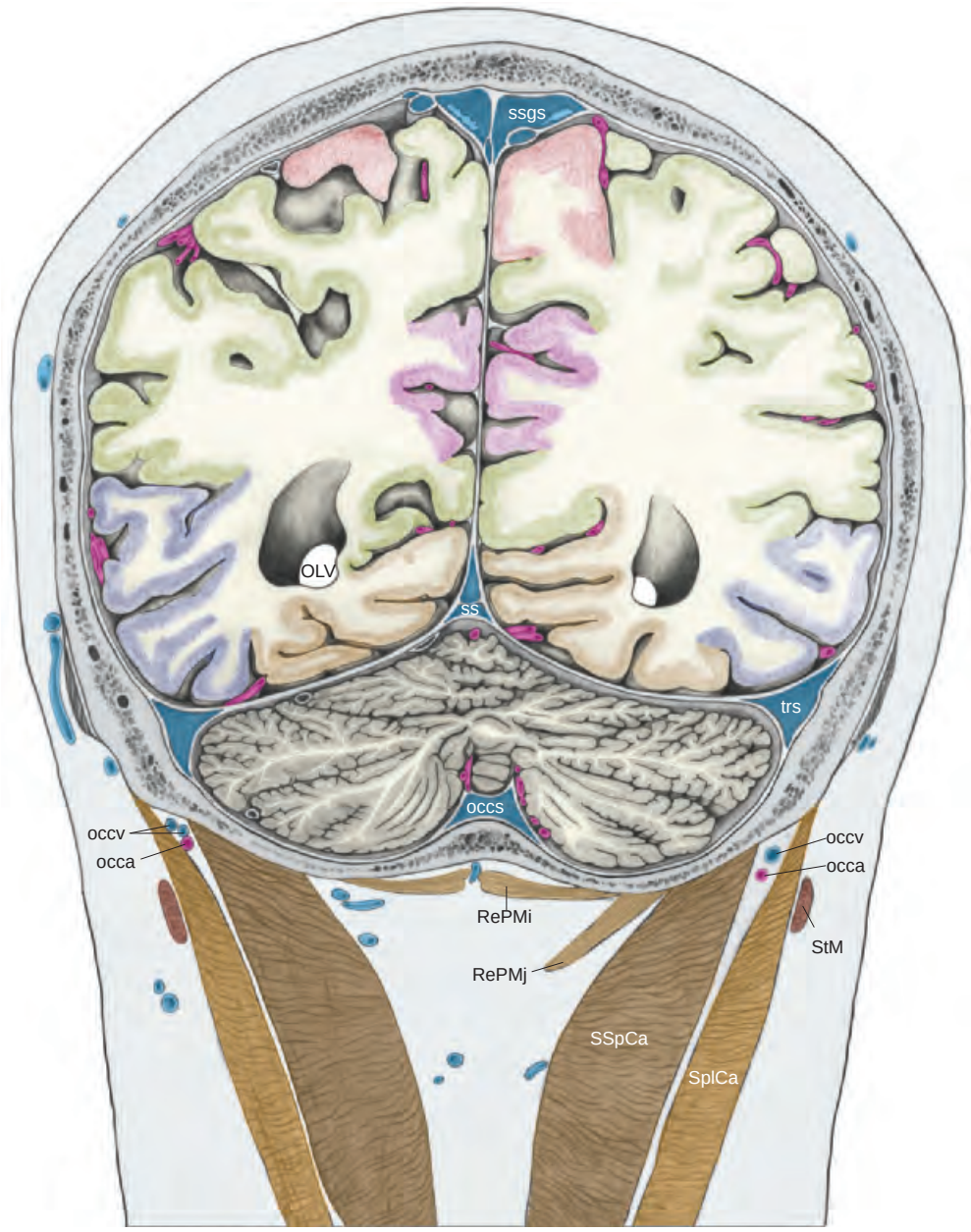
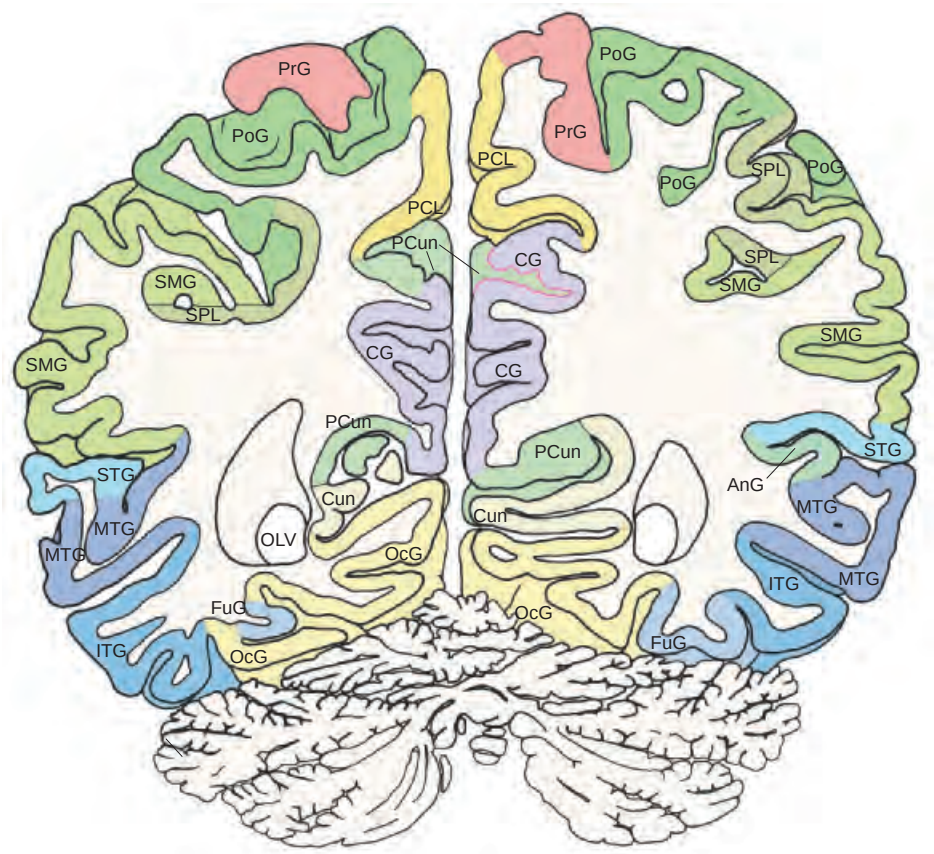
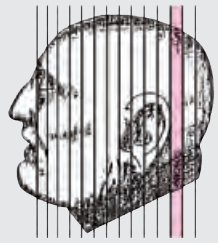


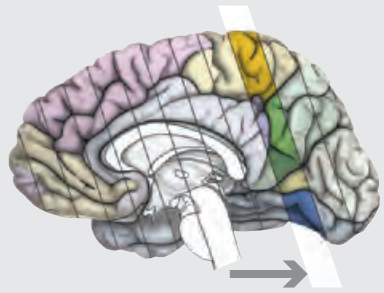






13

(anterior view)



Intracranial structures:

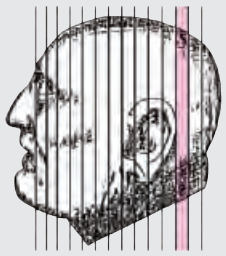
acer	anterior cerebral artery
AnG	angular gyrus
CG	cingulate gyrus
Cun	cuneus
FuG	fusiform gyrus
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MTG	middle temporal gyrus
occs	occipital sinus
OcG	occipital gyri
OLV	occipital horn of lateral ventricle
pcer	posterior cerebral artery
PCL	paracentral lobule
PCun	precuneus
PoG	postcentral gyrus
PrG	precentral gyrus
SMG	supramarginal gyrus
SPL	superior parietal lobule
ss	straight sinus
ssgs	superior sagittal sinus
STG	superior temporal gyrus
trs	transverse sinus

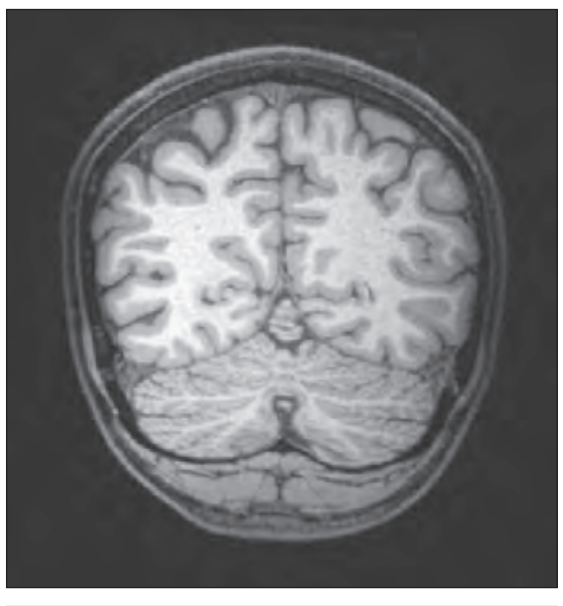
Peripheral structures:

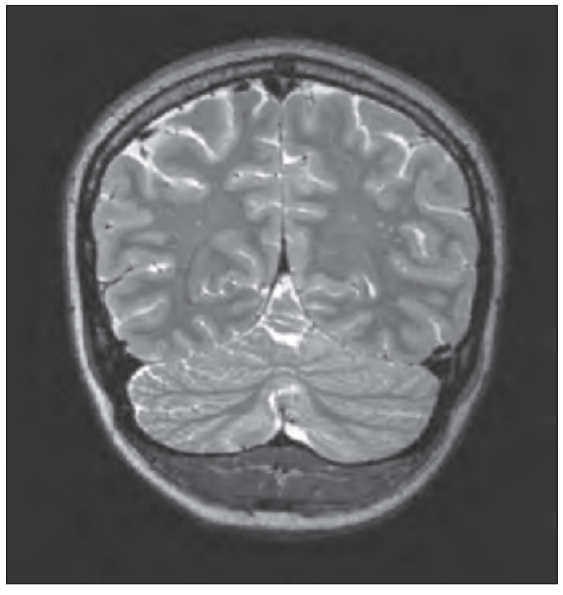
occa	occipital artery
occv	occipital vein
RePMi	rectus capitis post. minor muscle
RePMj	rectus capitis post. major muscle
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
StM	sternomastoid muscle

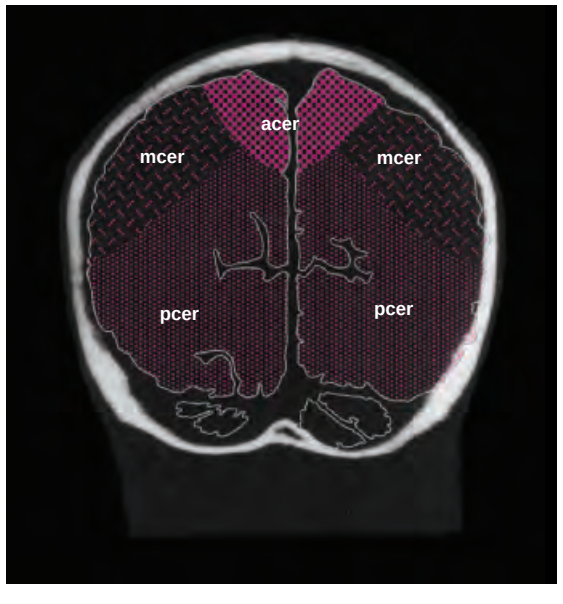
13

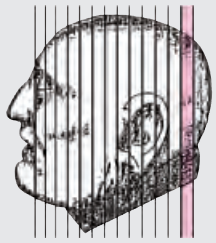
(posterior view)





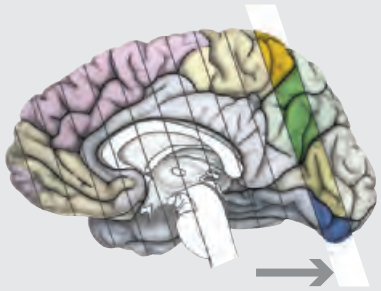


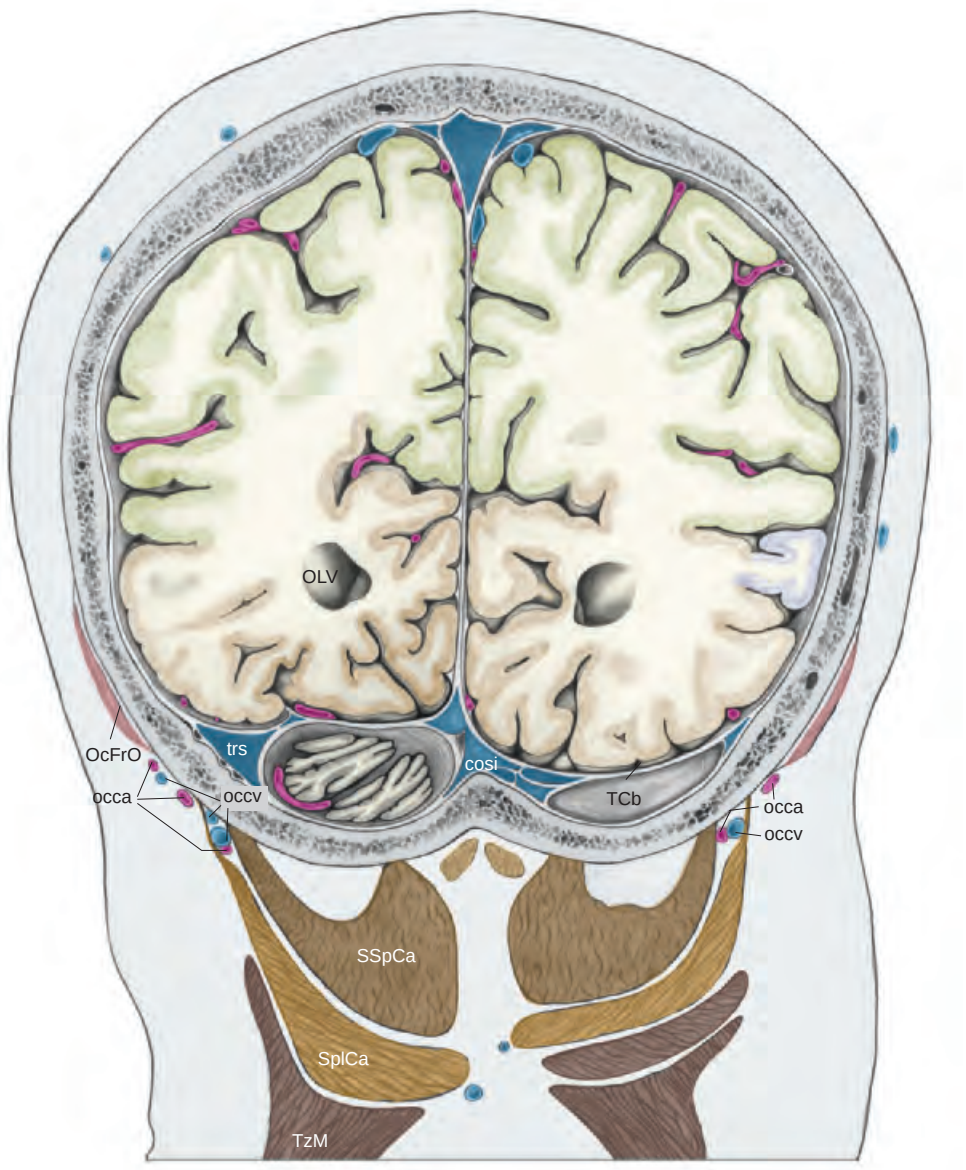




14

(anterior view)





Intracranial structures:

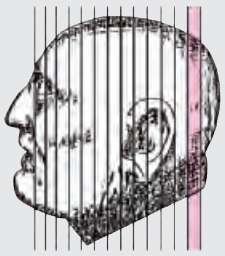
acer	anterior cerebral artery
AnG	angular gyrus
cosi	confluence of sinuses
Cun	cuneus
FuG	fusiform gyrus
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MTG	middle temporal gyrus
OcG	occipital gyri
OLV	occipital horn of lateral ventricle
pcer	posterior cerebral artery
PCL	paracentral lobule
PCun	precuneus
PoG	postcentral gyrus
PrG	precentral gyrus
SMG	supramarginal gyrus
SPL	superior parietal lobule
STG	superior temporal gyrus
TCb	tentorium cerebelli
trs	transverse sinus

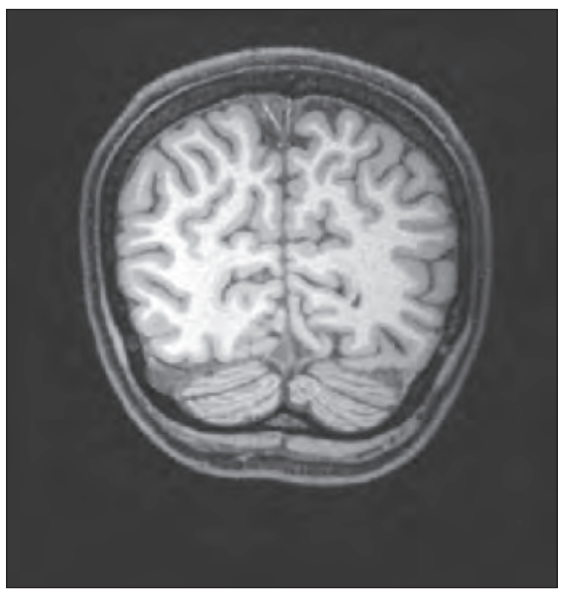
Peripheral structures:

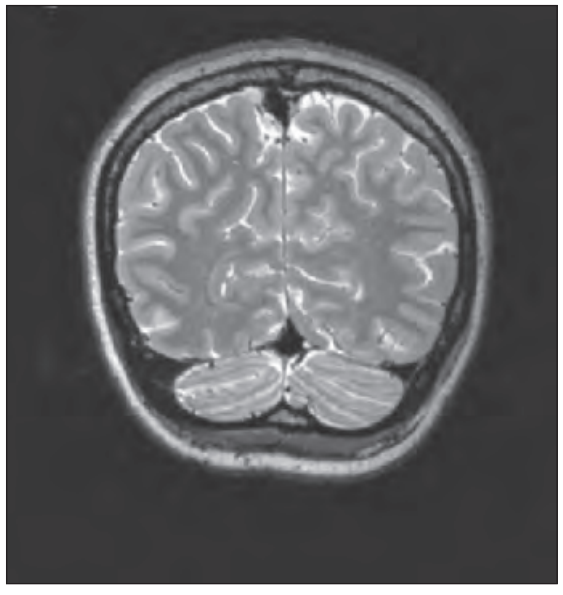
occa	occipital artery
occv	occipital vein
OcFrO	occipito-frontal muscle, occipital belly
SplCa	splenius capitis muscle
SSpCa	semispinalis capitis muscle
TzM	trapezius muscle

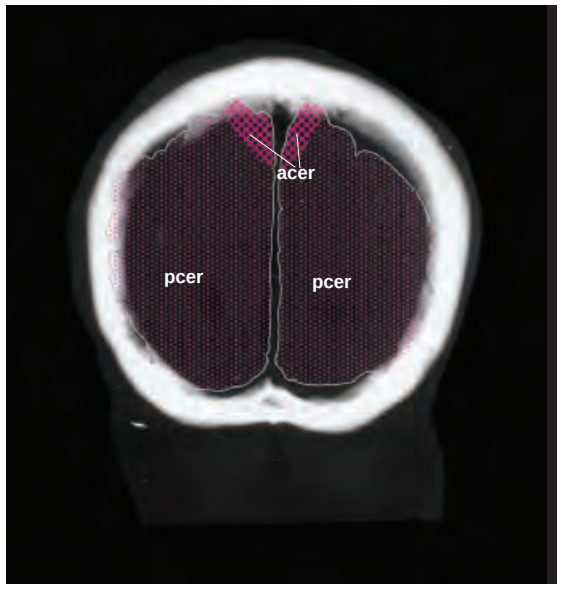
14

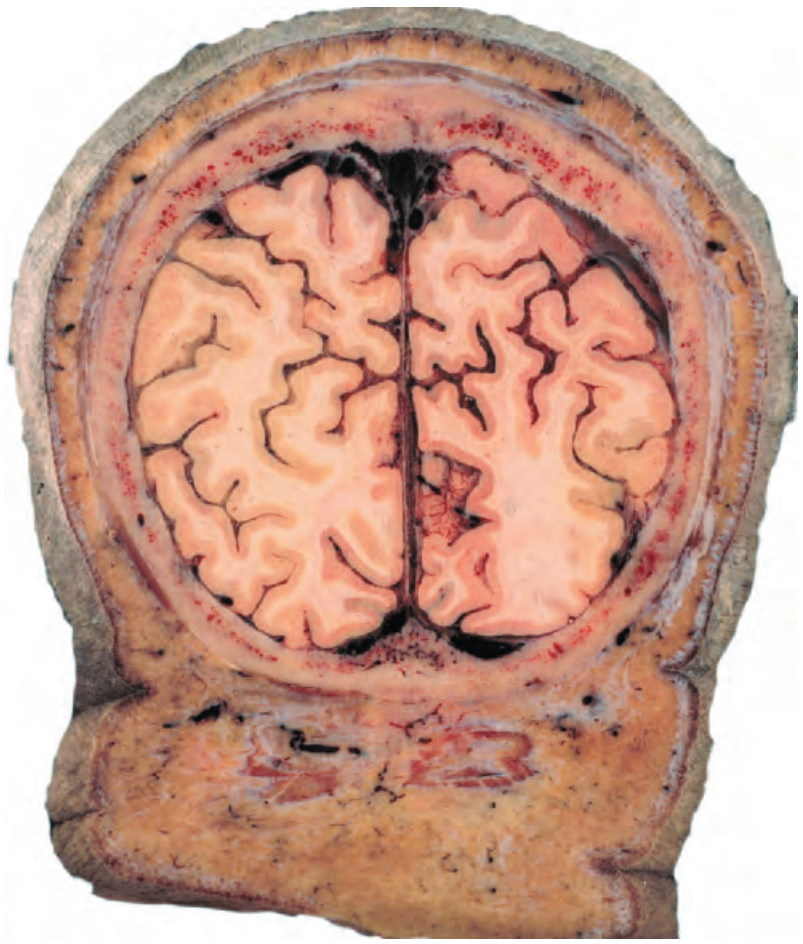
(posterior view)











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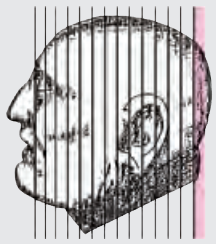
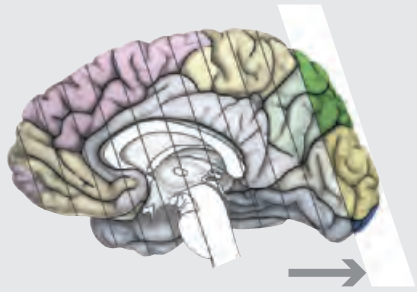
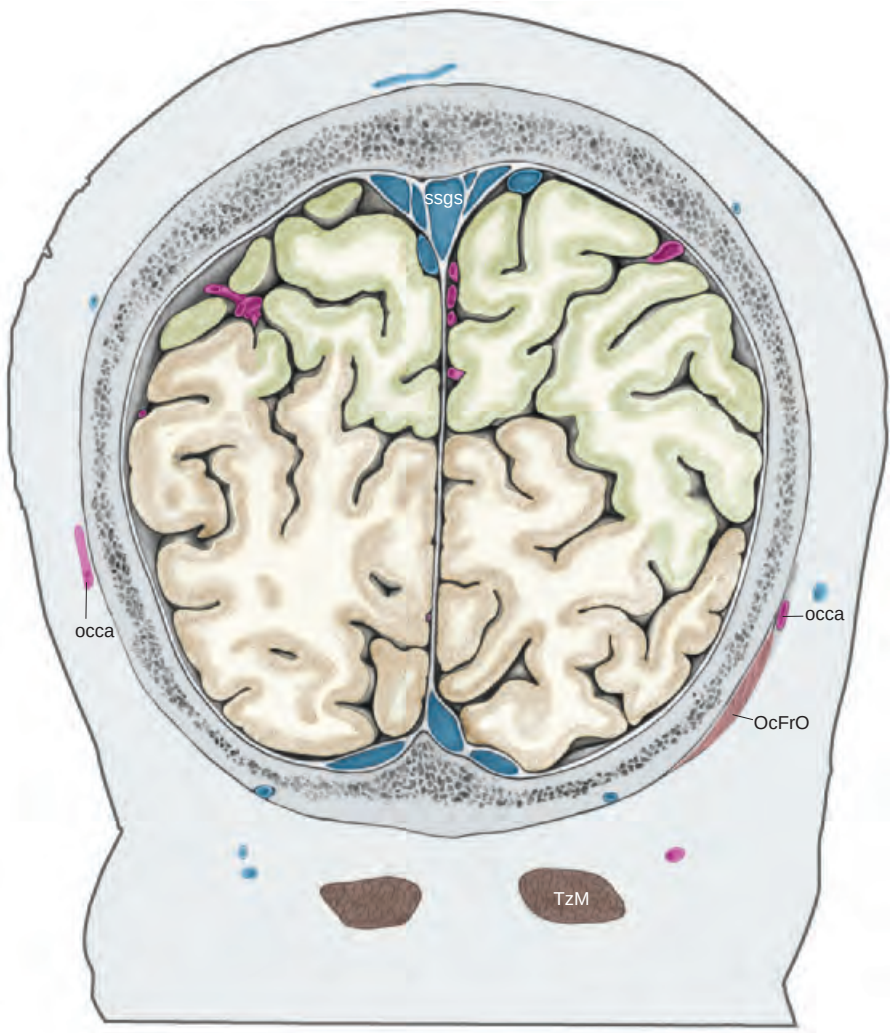


15

(anterior view)





Intracranial structures:

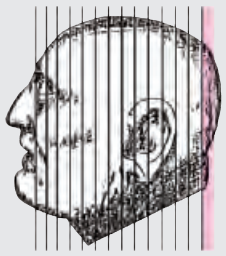
17	striate area
acer	anterior cerebral artery
AnG	angular gyrus
Cun	cuneus
OcG	occipital gyri
pcer	posterior cerebral artery
PCun	precuneus
PoG	postcentral gyrus
SPL	superior parietal lobule
ssgs	superior sagittal sinus

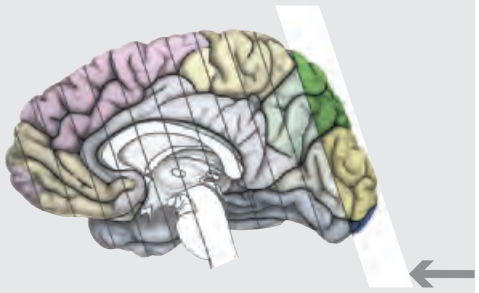
Peripheral structures:

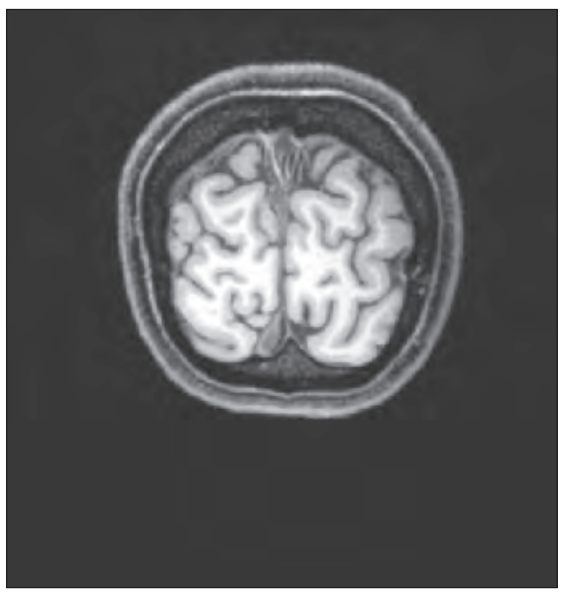
occa	occipital artery
OcFrO	occipito-frontal muscle, occipital belly
TzM	trapezius muscle

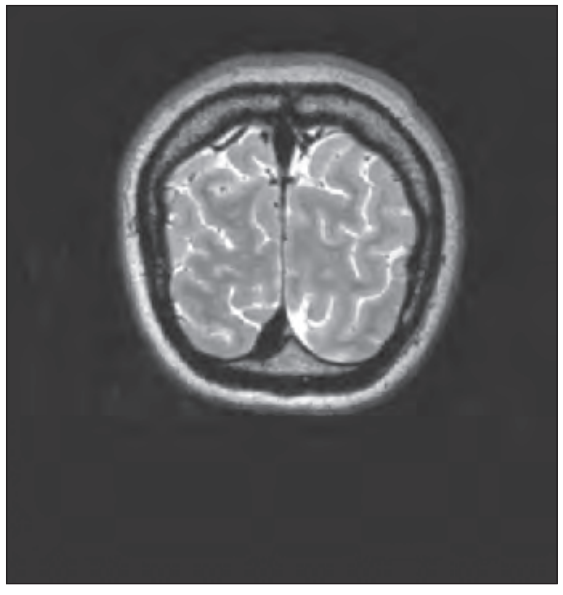
15

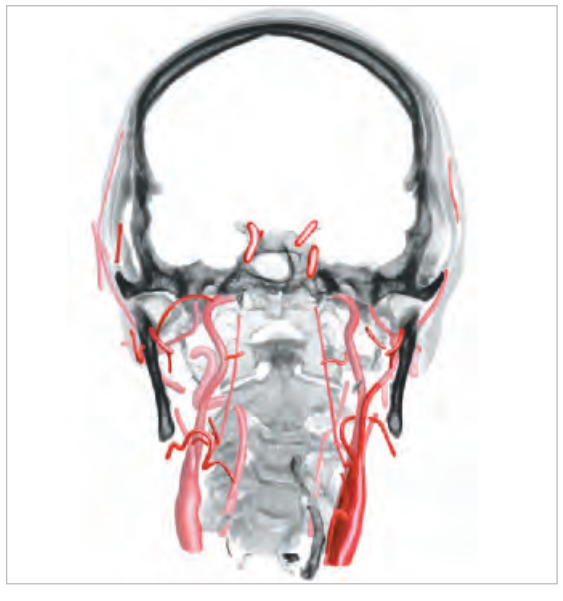
(posterior view)



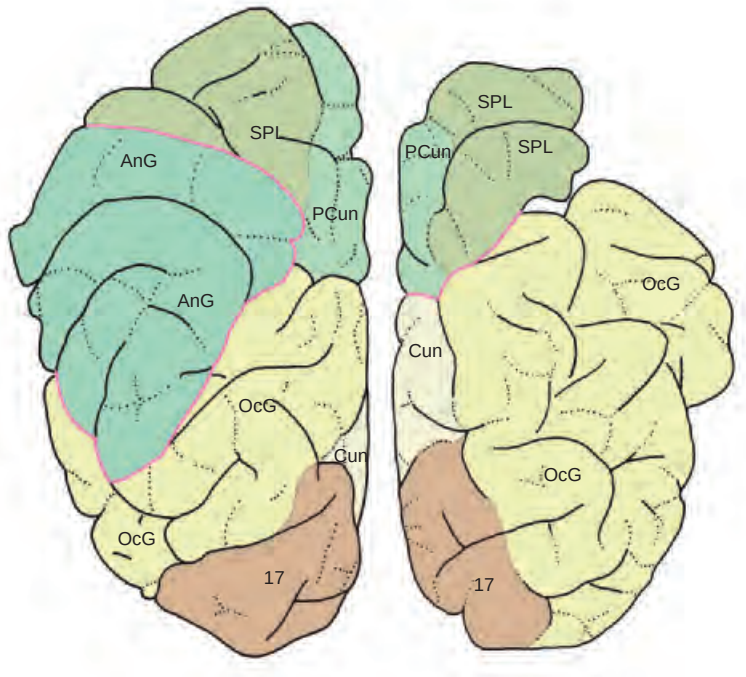








10 mm

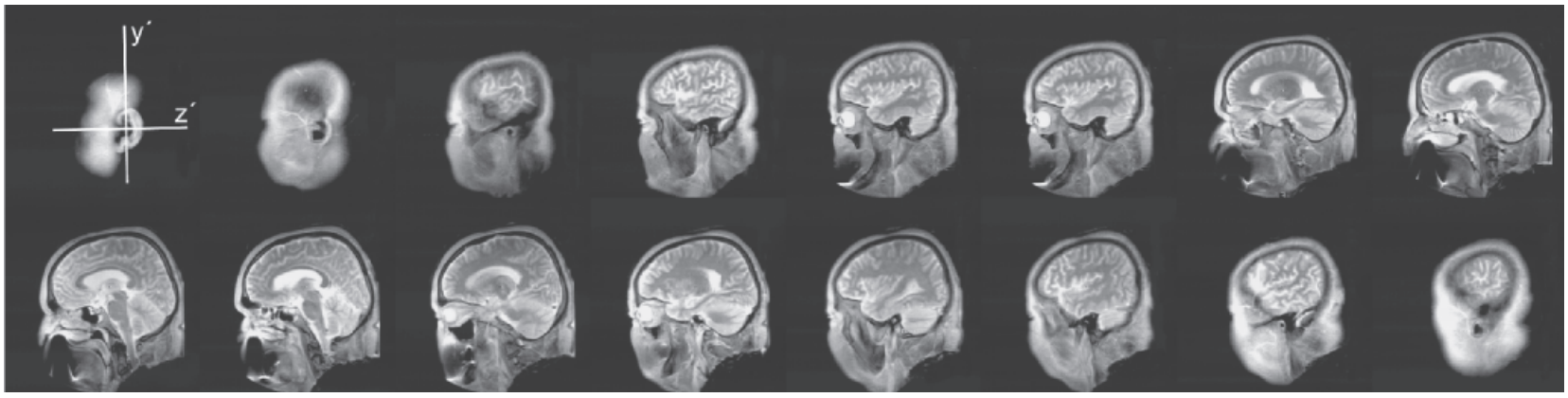


1.4 Sagittal Atlas of the Brain in the Head

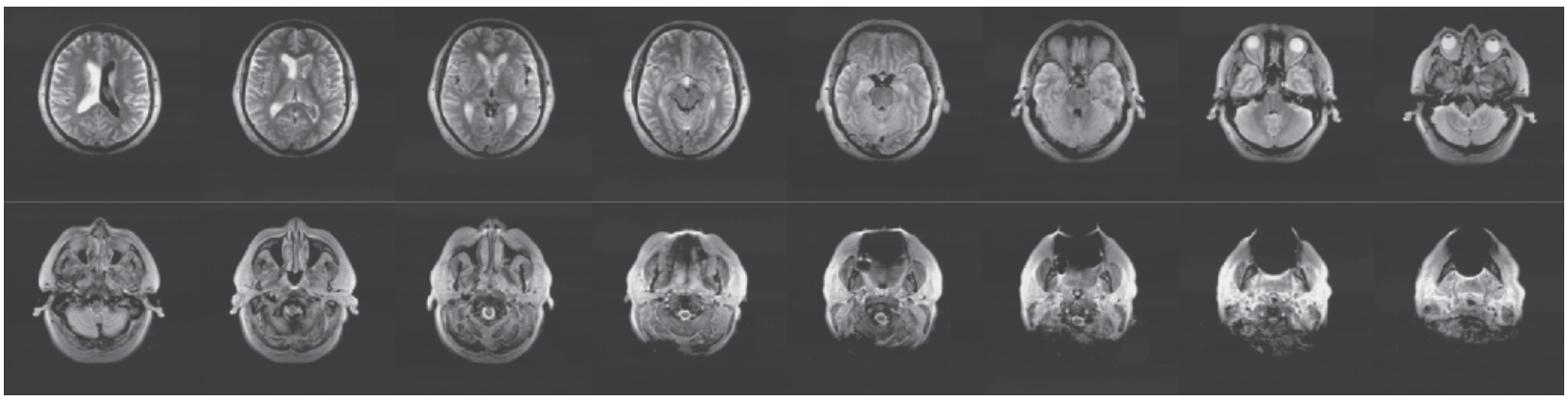
Cerebral structures:

17	striate area
AnG	angular gyrus
Cun	cuneus
OcG	occipital gyri
PCun	precuneus
SPL	superior parietal lobule

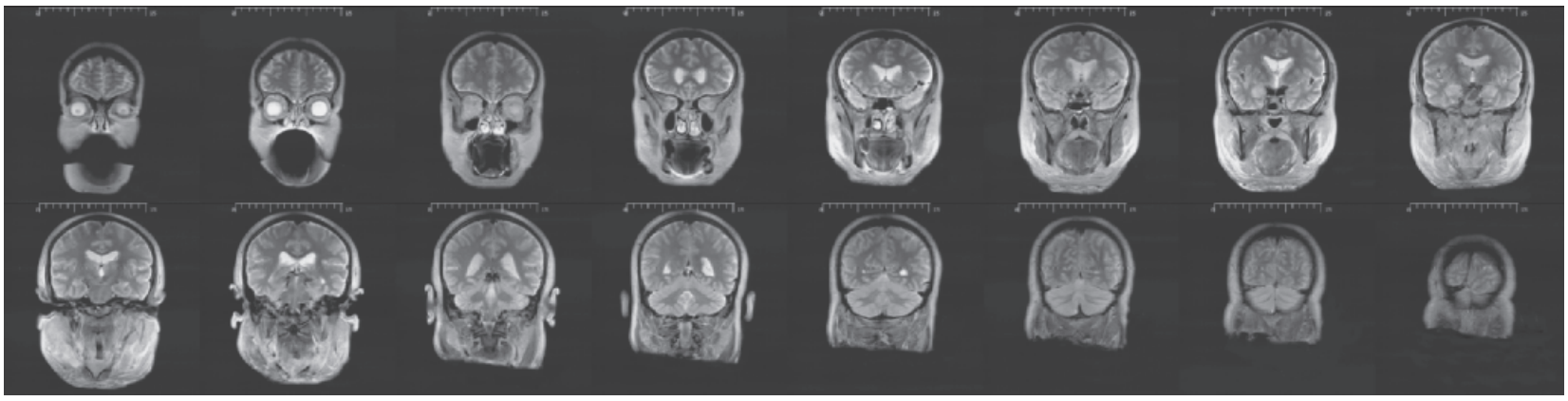
Sagittal plane:



y´- direction:

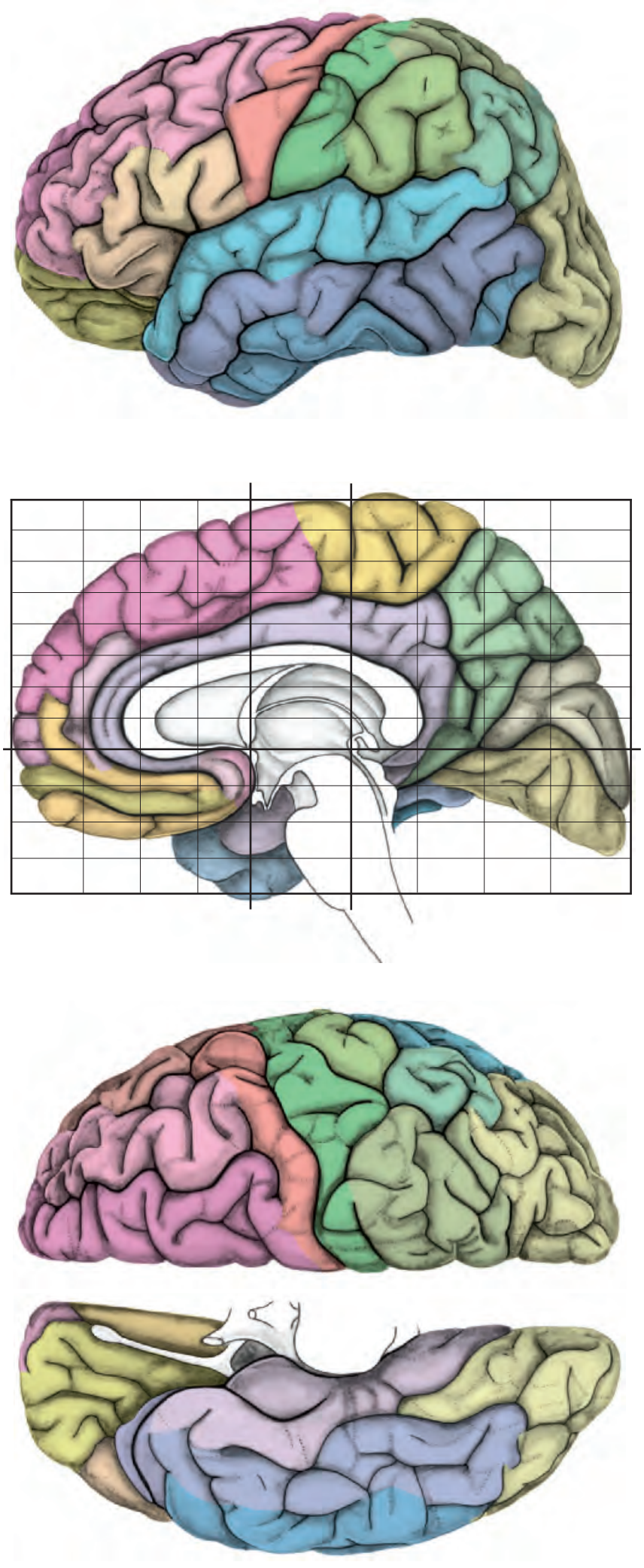


z´- direction:

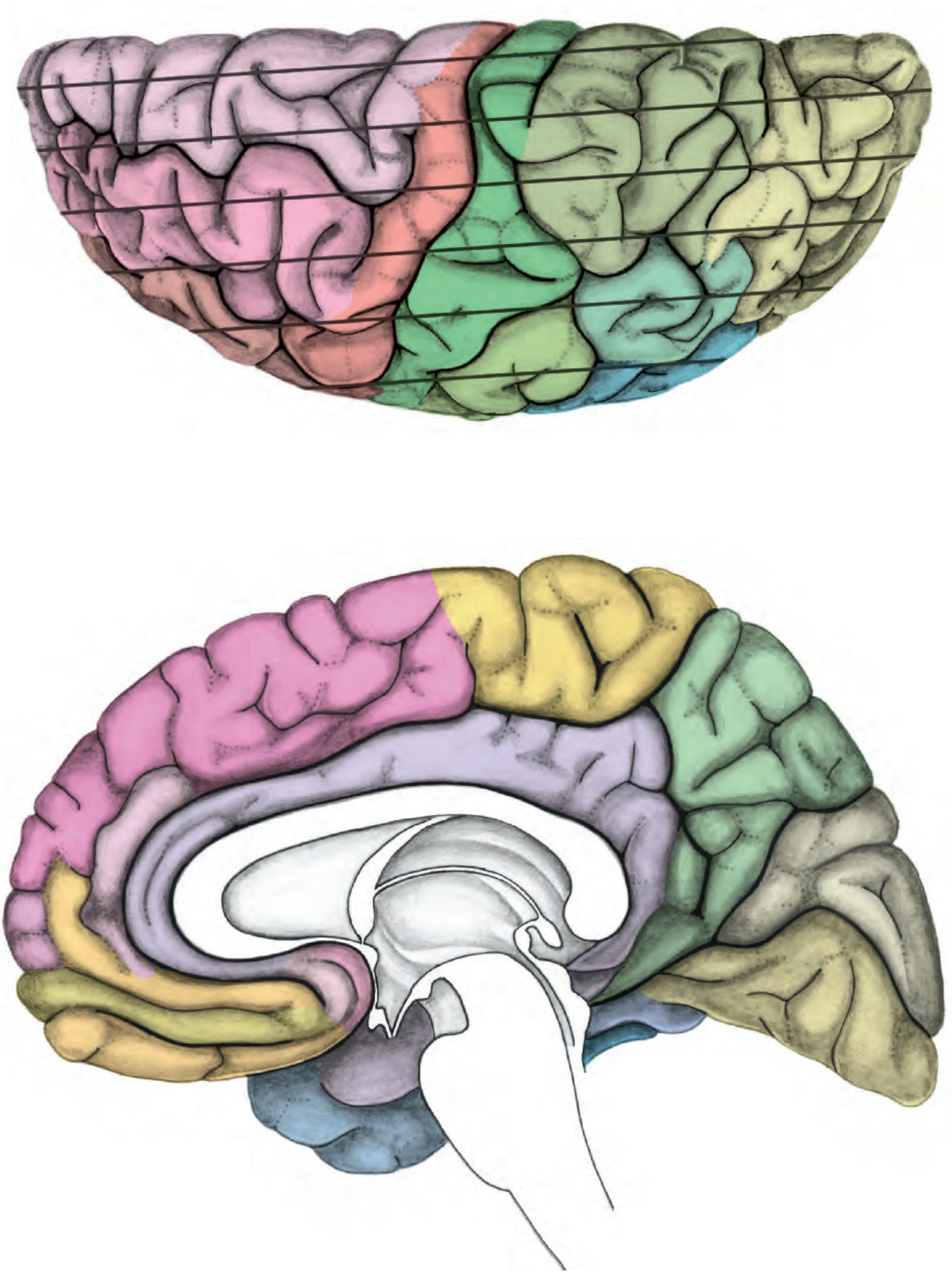


MR-images (prior to sectioning) in three planes of the head from which one hemisphere is shown on the following pages.

Parameters: 0.15 Tesla, matrix 256 x 256, field of view 25 cm, multi-slice, slice thickness 5 mm, 4 excitations, sequence: 5000/160. These heavy T2 weighted images highlight fluid-containing structures; uneven fluid collections (see lateral ventricles) are, therefore, visible. Note also that a dental prosthesis caused single void and deviation artefacts. The top panel presents the sagittal MRIs and specifies the planes of sectioning of the middle and lower panel. Orientation of these MRIs was based on the intercommissural line. Therefore, the orientation of the horizontal MRIs in the middle panel corresponds to the plane of cryosectioning of the head. Direct comparisons can be made with in-vivo MRIs which accompany that series of sections. The lower panel presents the coronal MRIs.



Surface views of the left hemisphere which is shown in the subsequent pages. The drawings of the hemisphere are arranged such that they always show the same anterior-posterior orientation. The most important gyri are delineated. The midsagittal view depicts the hemisphere with the Talairach space.



Surface views of the left hemisphere of the brain which has been sectioned in the sagittal plane as indicated. The drawing of the mid-sagittal view has been *mirror-imaged.*

3

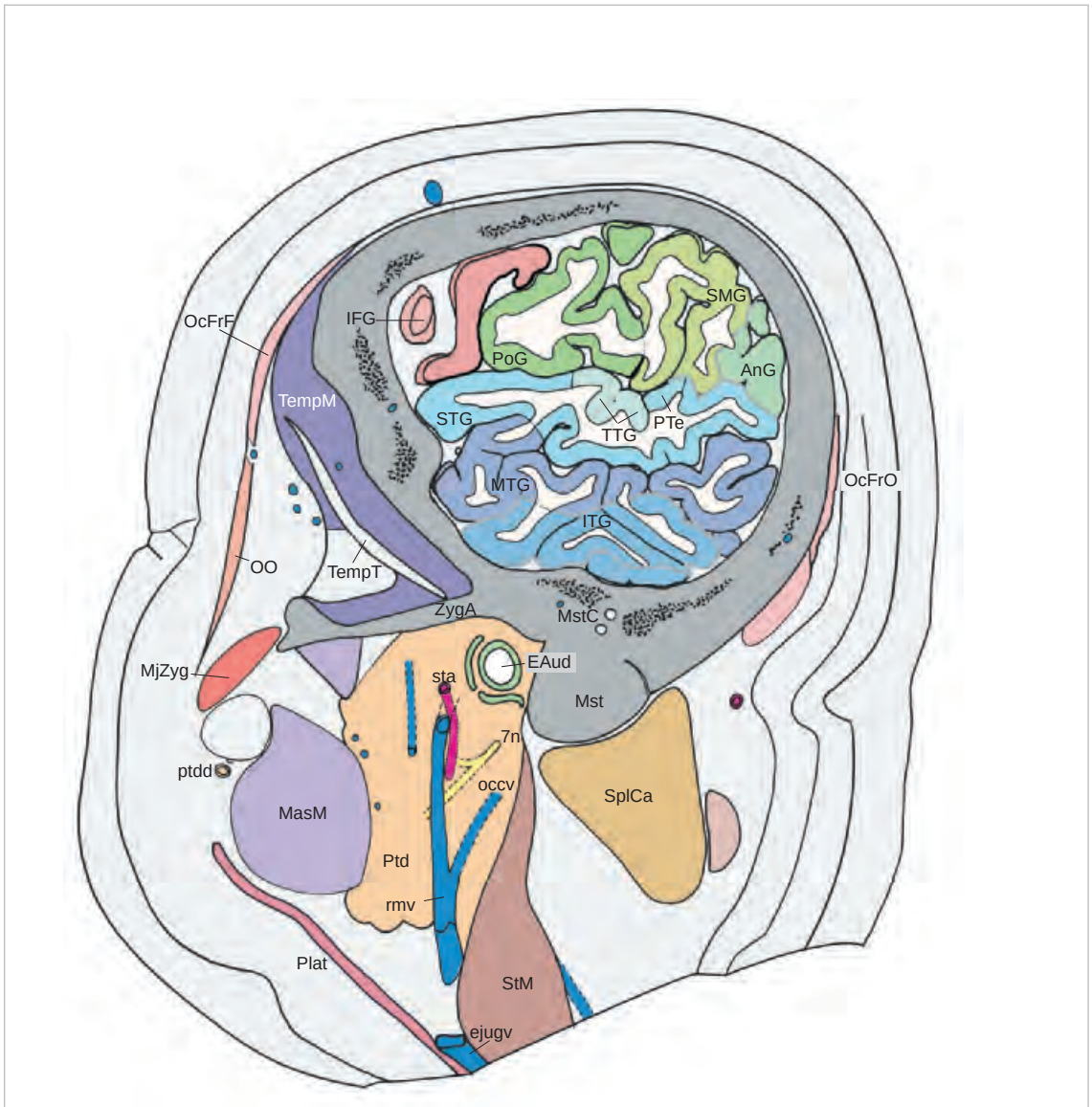
(lateral view)

Intracranial structures:

AnG	angular gyrus
IFG	inferior frontal gyrus
ITG	inferior temporal gyrus
MTG	middle temporal gyrus
PoG	postcentral gyrus
PrG	precentral gyrus
PTe	planum temporale
SMG	supramarginal gyrus
STG	superior temporal gyrus
TTG	transverse temporal gyri

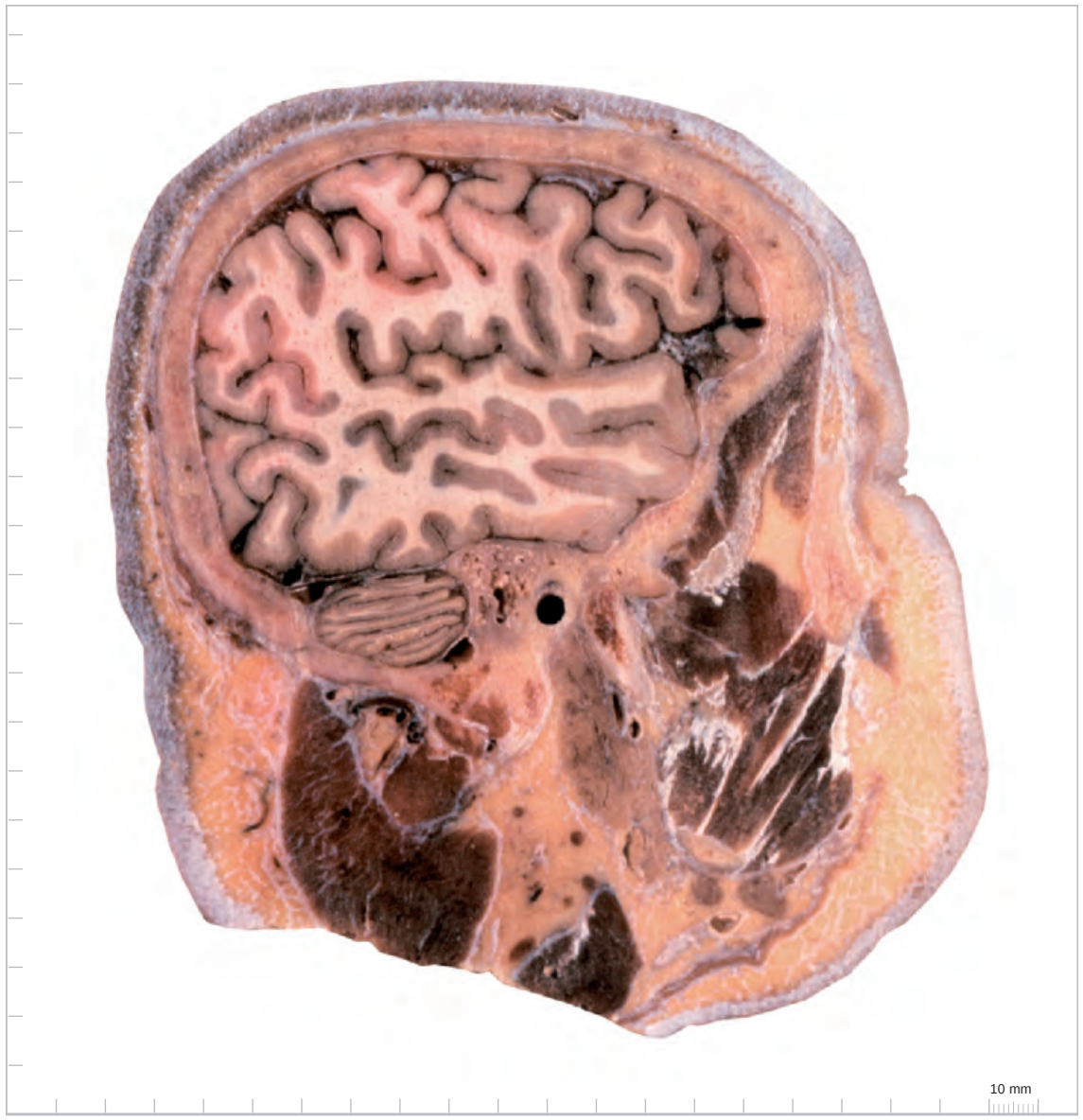
Peripheral structures:

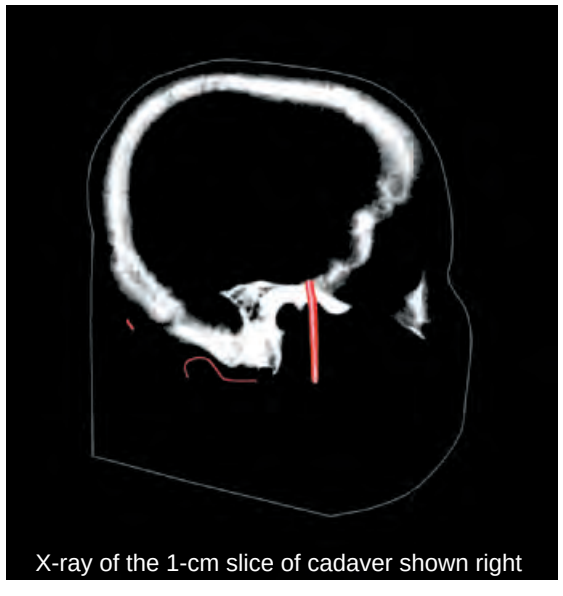
7n	facial nerve
EAud	external auditory meatus
ejugv	external jugular vein
MasM	masseter muscle
MjZyg	major zygomaticus muscle
Mst	mastoid process of temporal bone
MstC	mastoid cells
occv	occipital vein
OcFrF	occipito-frontal muscle, frontal belly
OcFrO	occipito-frontal muscle, occipital belly
OO	orbicularis oculi muscle
Plat	platysma
Ptd	parotid gland
ptdd	parotid duct
rmv	retromandibular vein
SplCa	splenius capitis muscle
sta	superficial temporal artery
StM	sternomastoid muscle
TempM	temporalis muscle
TempT	temporalis muscle, tendon
ZygA	zygomatic arch



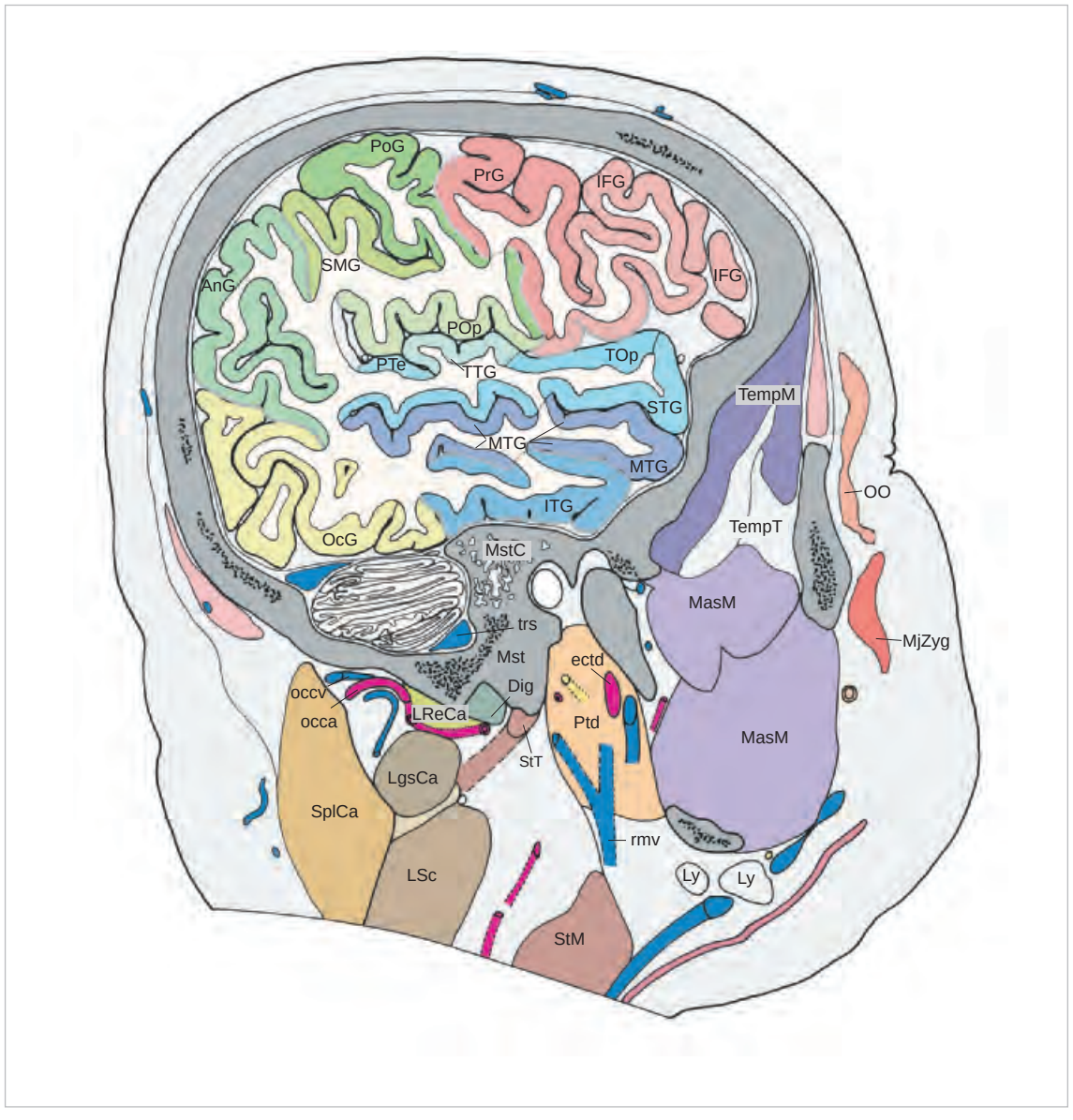
3

(medial view)





X-ray of the 1-cm slice of cadaver shown right



4

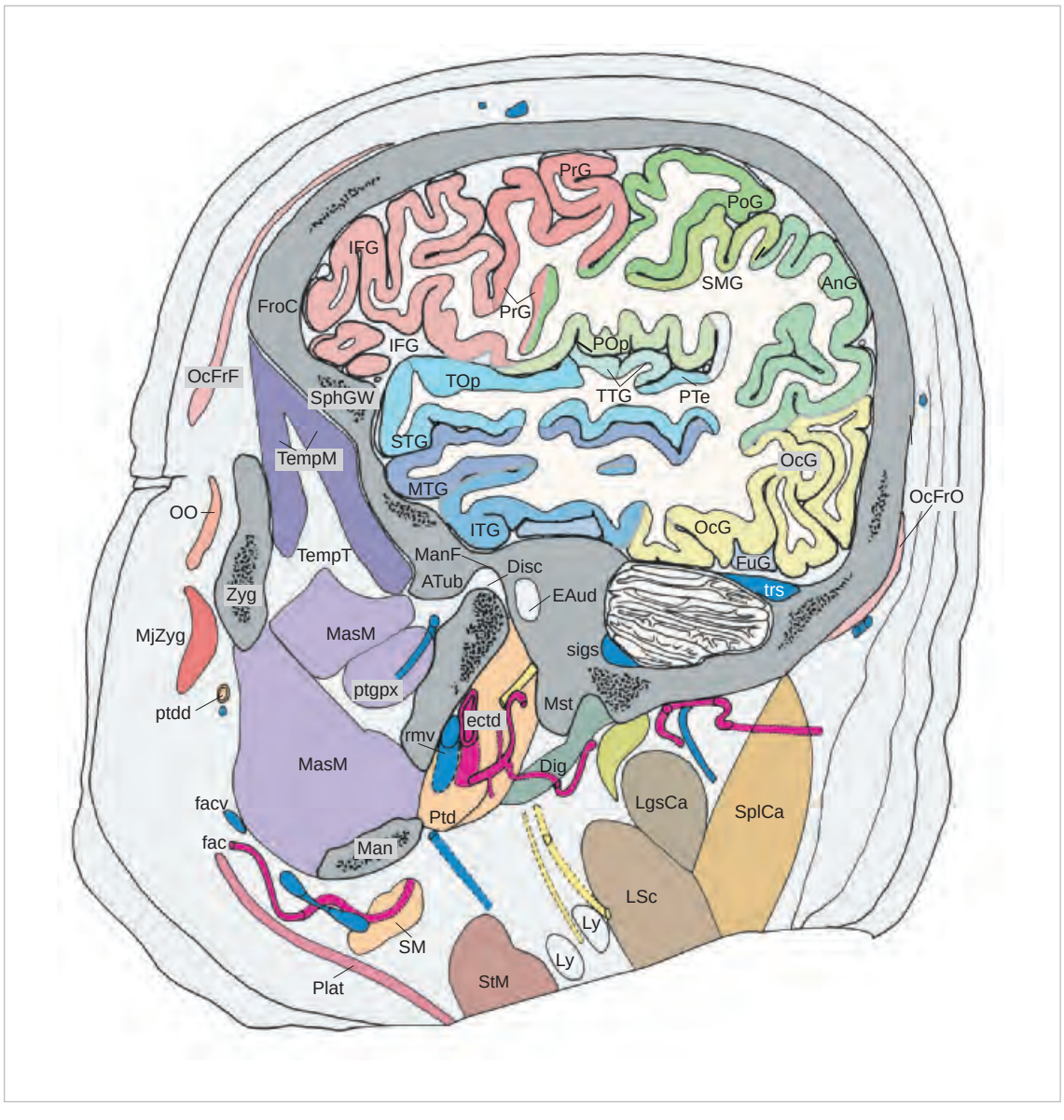
(lateral view)

Intracranial structures:

AnG	angular gyrus
FuG	fusiform gyrus
IFG	inferior frontal gyrus
ITG	inferior temporal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
PoG	postcentral gyrus
POp	parietal operculum
PrG	precentral gyrus
PTe	planum temporale
sigs	sigmoid sinus
SMG	supramarginal gyrus
STG	superior temporal gyrus
TOp	temporal operculum
trs	transverse sinus
TTG	transverse temporal gyri

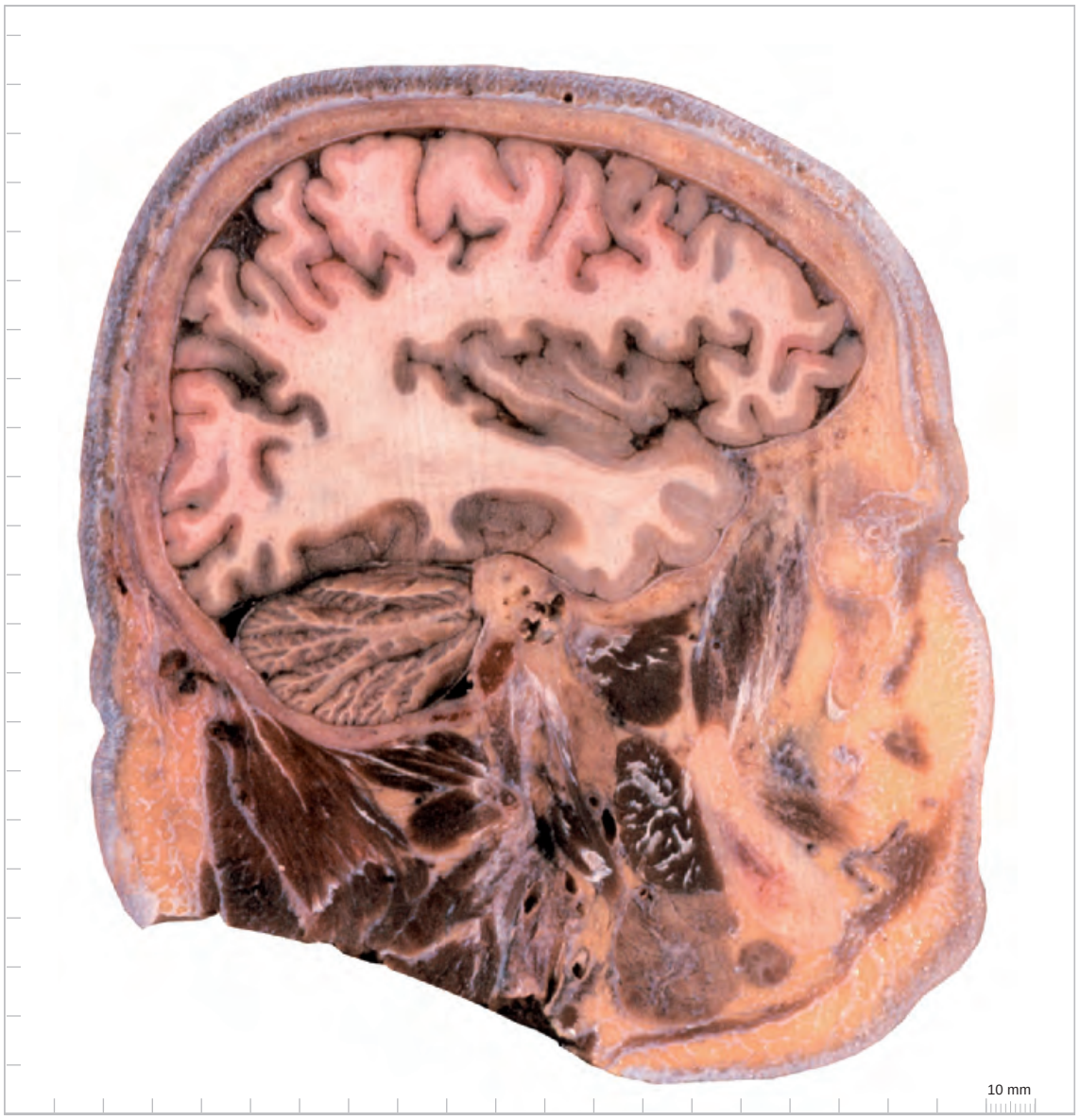
Peripheral structures:

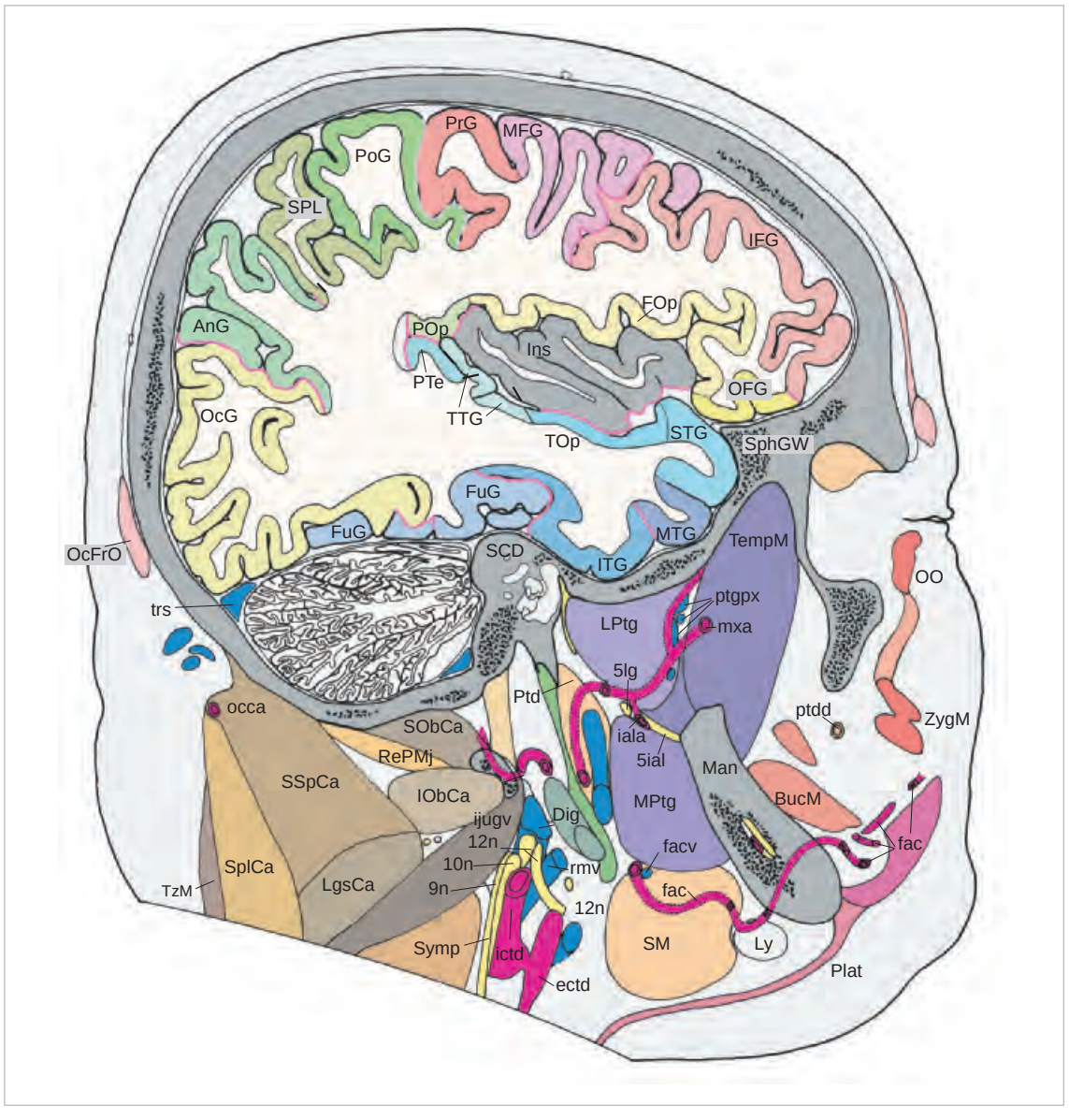
ATub	articular tubercle
Dig	digastric muscle
Disc	disk of temporo mandibular joint
EAud	external auditory meatus
ectd	external carotid artery
fac	facial artery
facv	facial vein
FroC	frontal crest
LgsCa	longissimus capitis muscle
LReCa	lateral rectus capitis muscle
LSc	levator scapulae muscle
Ly	lymph node
Man	mandible
ManF	mandibular fossa
MasM	masseter muscle
MjZyg	major zygomaticus muscle
Mst	mastoid process of temporal bone
MstC	mastoid cells
occa	occipital artery
occv	occipital vein
OcFrF	occipito-frontal muscle, frontal belly
OcFrO	occipito-frontal muscle, occipital belly
OO	orbicularis oculi muscle
Plat	platysma
Ptd	parotid gland
ptdd	parotid duct
ptgpx	pterygoid plexus
rmv	retromandibular vein
SM	submandibular gland
SplCa	splenius capitis muscle
SphGW	sphenoid, greater wing
StM	sternomastoid muscle
StT	sternomastoid muscle, tendon
TempM	temporalis muscle
TempT	temporalis muscle, tendon
Zyg	zygomatic bone

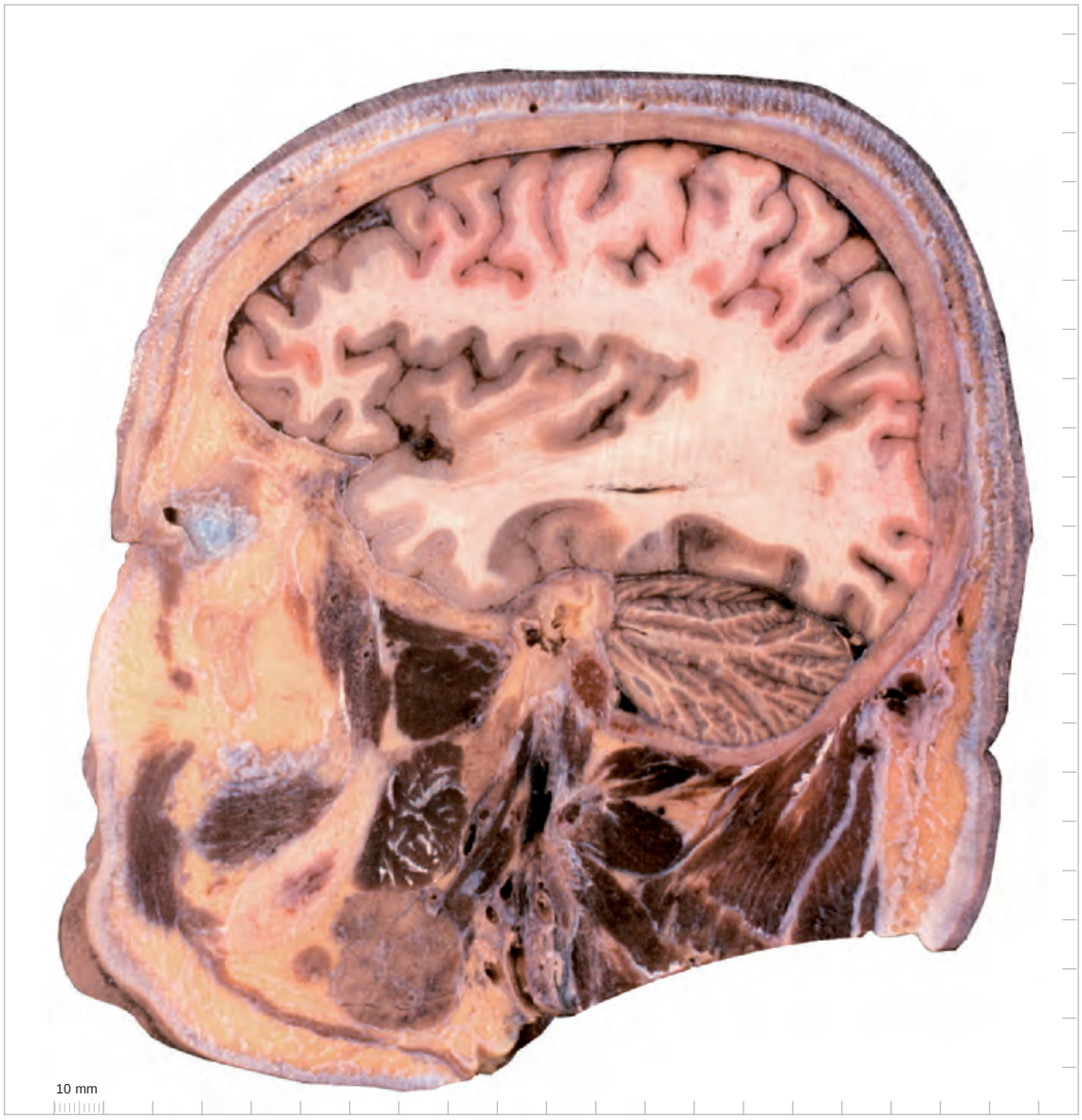


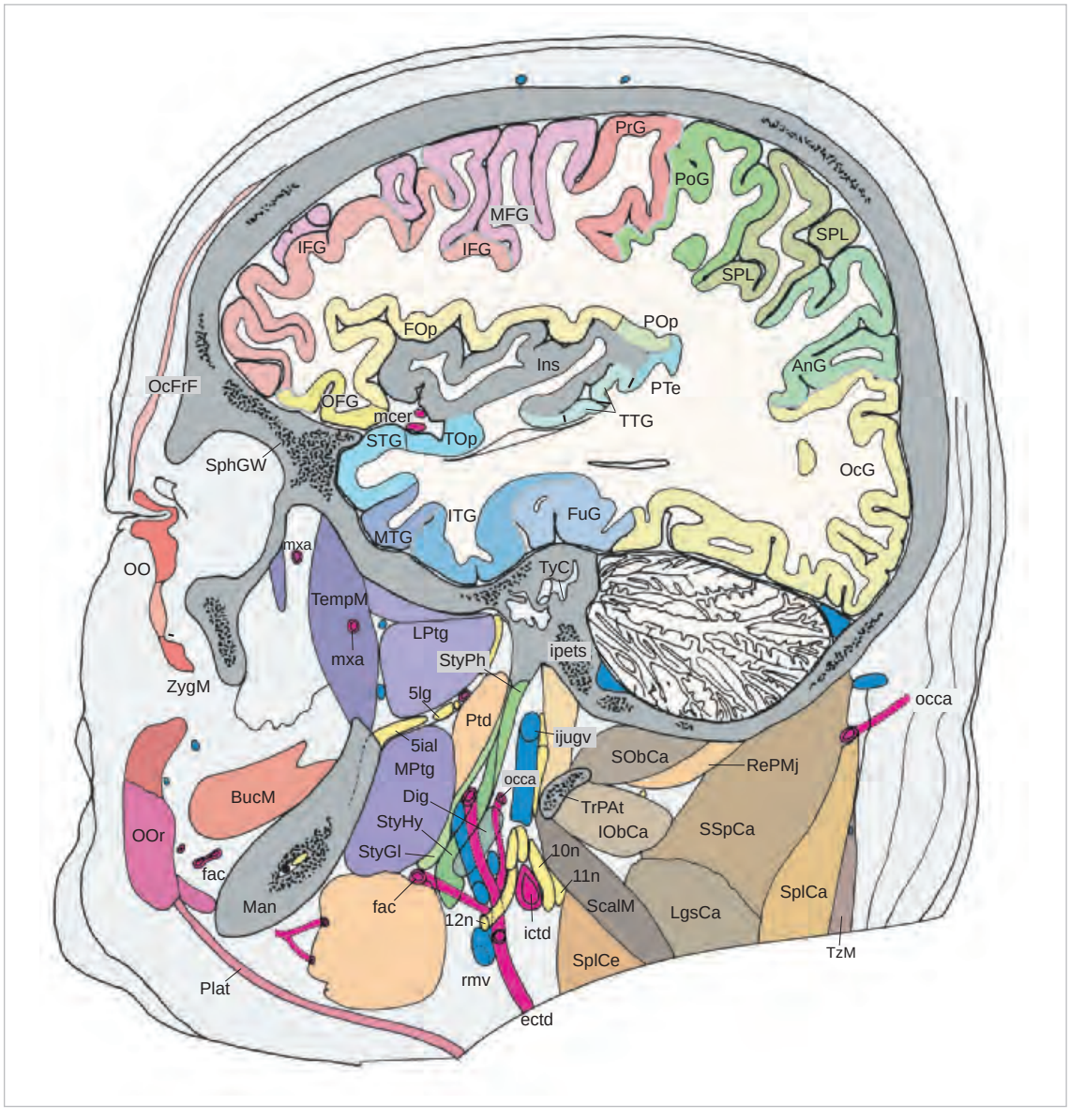
4

(medial view)









5

(lateral view)

Intracranial structures:

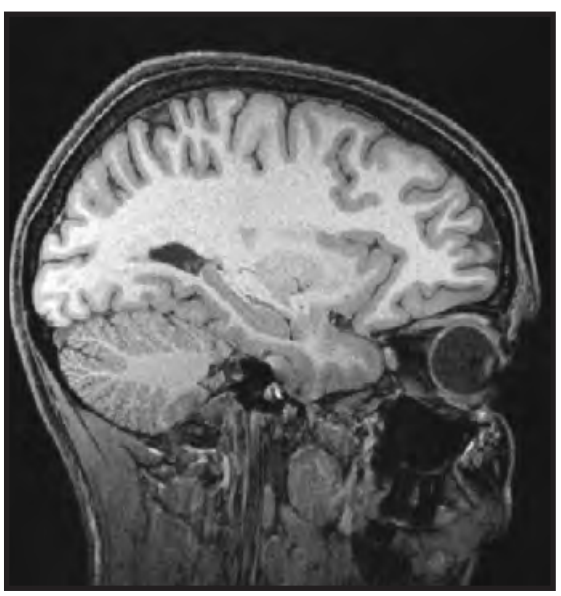
FOp	frontal operculum
FuG	fusiform gyrus
IFG	inferior frontal gyrus
Ins	insula
ipets	inferior petrosal sinus
ITG	inferior temporal gyrus
mcer	middle cerebral artery
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
OFG	orbitofrontal gyri
PoG	postcentral gyrus
POp	parietal operculum
PrG	precentral gyrus
PTe	planum temporale
SMG	supramarginal gyrus
SPL	superior parietal lobule
STG	superior temporal gyrus
TOp	temporal operculum
trs	transverse sinus
TTG	transverse temporal gyri

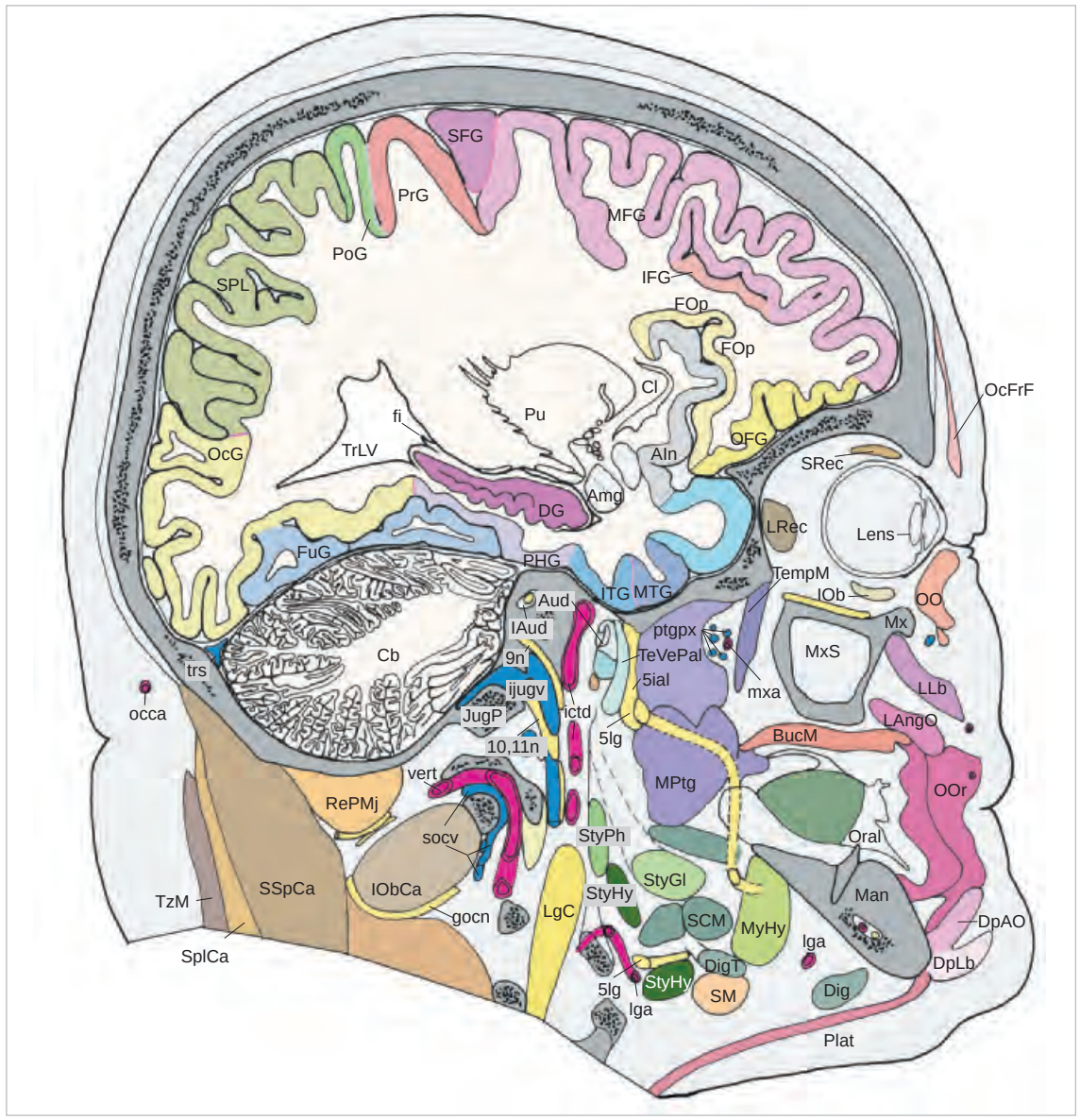
Peripheral structures:

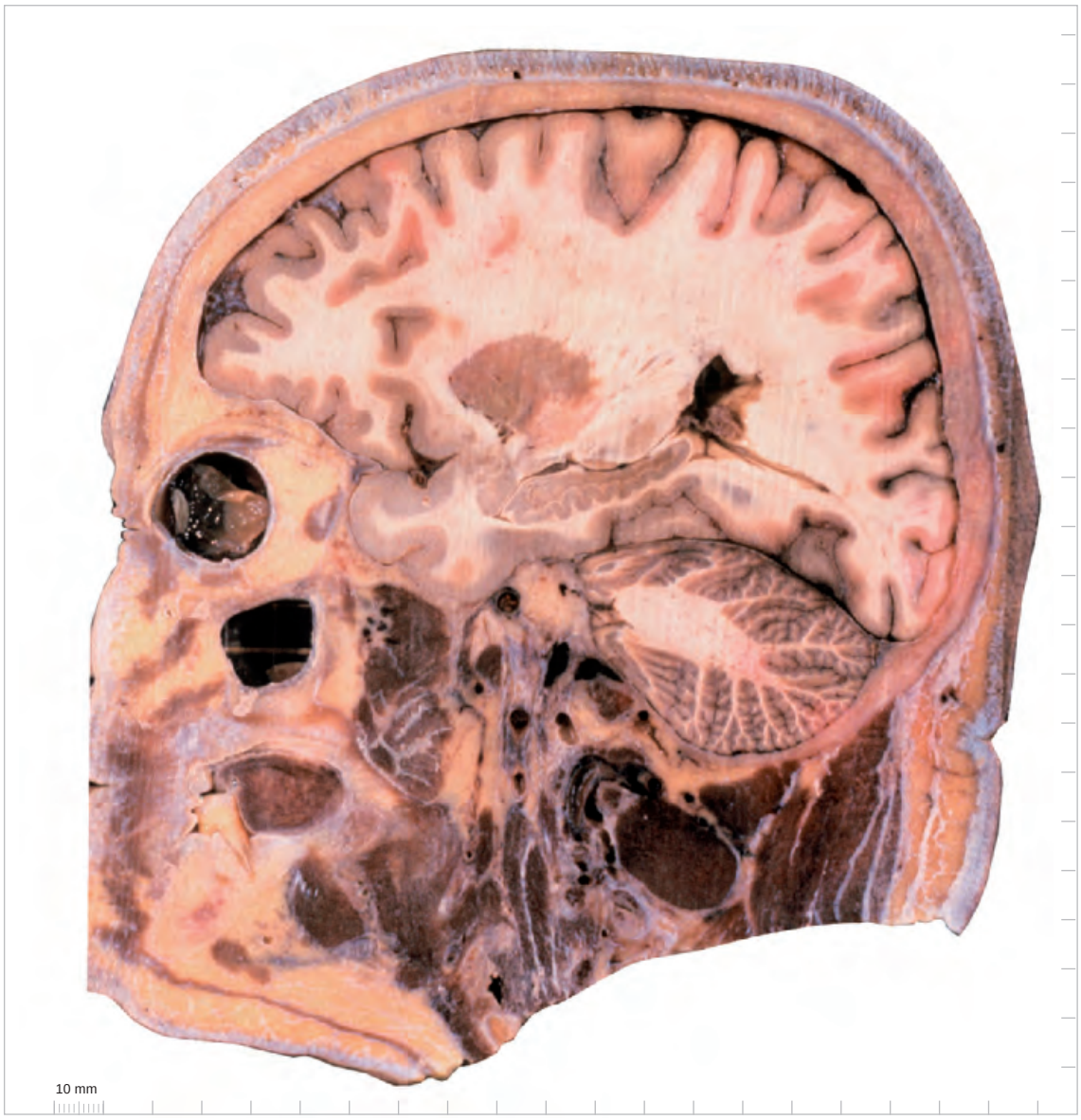
5ial	inferior alveolar nerve
5lg	lingual nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve or its root
BucM	buccinator muscle
Dig	digastric muscle
ectd	external carotid artery
fac	facial artery
facv	facial vein
iala	inferior alveolar artery
ictd	internal carotid artery
ijugv	internal jugular vein
IObCa	inferior oblique capitis muscle
LgsCa	longissimus capitis muscle
LPtg	lateral pterygoid muscle
Ly	lymph node
Man	mandible
MPtg	medial pterygoid muscle
mxa	maxillary artery
occa	occipital artery
OcFrF	occipito-frontal muscle, frontal belly
OcFrO	occipito-frontal muscle, occipital belly
OO	orbicularis oculi muscle
OOr	orbicularis oris muscle
Plat	platysma
Ptd	parotid gland
ptdd	parotid duct
ptgpx	pterygoid plexus
RePMj	rectus capitis posterior major muscle
rmv	retromandibular vein
ScalM	scalenus muscle
SCD	semicircular ducts
SM	submandibular gland
SObCa	superior oblique capitis muscle
SplCa	splenius capitis muscle
SplCe	splenius cervicis muscle
SphGW	sphenoid, greater wing
SSpCa	semispinalis capitis muscle
StyGl	styloglossus muscle
StyHy	stylohyoid muscle
StyPh	stylopharyngeus muscle
Symp	sympathetic trunk
TempM	temporalis muscle
TrPAt	transverse process of the atlas
TyC	tympanic cavity
TzM	trapezius muscle
ZygM	zygomatic muscles

5

(medial view)

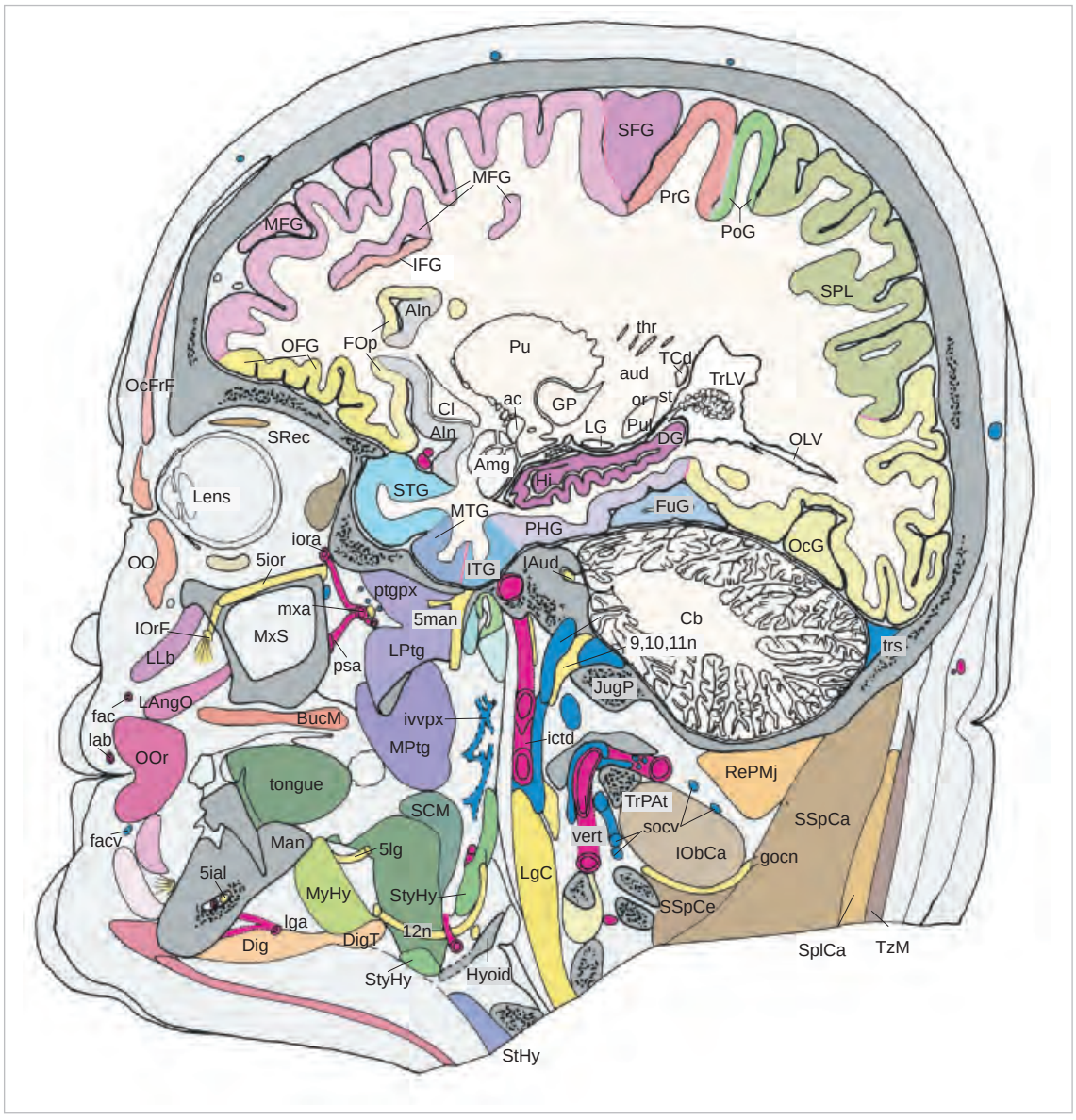






6

(lateral view)



Intracranial structures:

ac	anterior commissure
AIn	agranular insular cortex (claustro-cortex insularis)
Amg	amygdala
aud	auditory radiation
Cb	cerebellum
Cl	claustrum
DG	dentate gyrus
fi	fimbria of the the hippocampus
FOp	frontal operculum
FuG	fusiform gyrus
GP	globus pallidus
Hi	hippocampus
IFG	inferior frontal gyrus
ITG	inferior temporal gyrus
LG	lateral geniculate nucleus
MFG	middle frontal gyrus
MTG	middle temporal gyrus
OcG	occipital gyri
OFG	orbitofrontal gyri
OLV	occipital horn of lateral ventricle
or	optic radiation
PHG	parahippocampal gyrus
PoG	postcentral gyrus
PrG	precentral gyrus
Pu	putamen
Pul	pulvinar thalami
SFG	superior frontal gyrus
SPL	superior parietal lobule
st	stria terminalis
STG	superior temporal gyrus
TCd	tail of caudate nucleus
thr	thalamic radiation (corona radiata)
TrLV	trigone of lateral ventricle

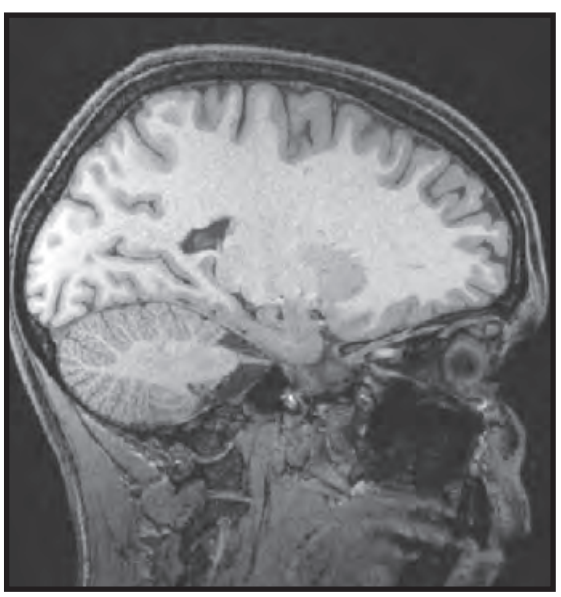
Peripheral structures:

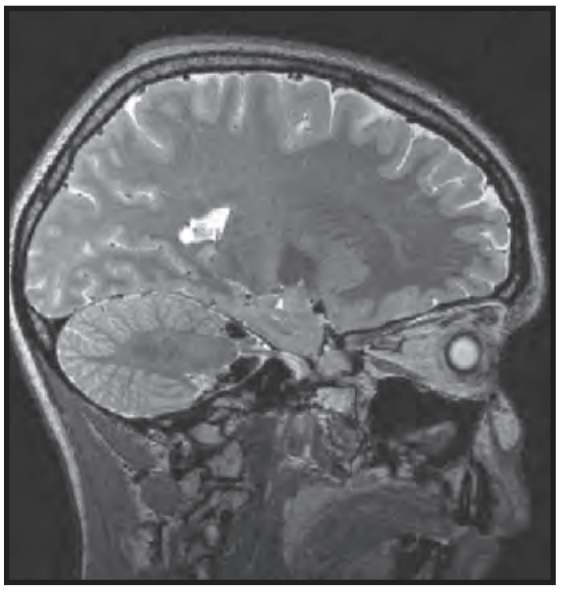
5ial	inferior alveolar nerve
5ior	infraorbital nerve
5lg	lingual nerve
5man	mandibular nerve
9n	glossopharyngeal nerve
10n	vagus nerve
11n	accessory nerve
12n	hypoglossal nerve
Aud	auditory tube
BucM	buccinator muscle
Dig	digastric muscle
DigT	digastric muscle, tendon
DpAO	depressor anguli oris muscle
DpLb	depressor labii inferioris muscle
fac	facial artery
facv	facial vein
gocn	greater occipital nerve
lAud	internal auditory meatus
ictd	internal carotid artery
ijugv	internal jugular vein & sigmoid sinus
IOb	inferior oblique muscle
IObCa	inferior oblique capitis muscle
iora	infraorbital artery
IOrF	infraorbital foramen
ivvpx	internal vertebral venous plexus
JugP	jugular process
lab	labial artery
LAngO	levator anguli oris muscle
lga	lingual artery
LgC	longus capitis and colli muscles
lgv	lingual vein
LLb	levator labii superioris muscle
LPtg	lateral pterygoid muscle
LRec	lateral rectus muscle
SM	submandibular gland
socv	suboccipital venous plexus

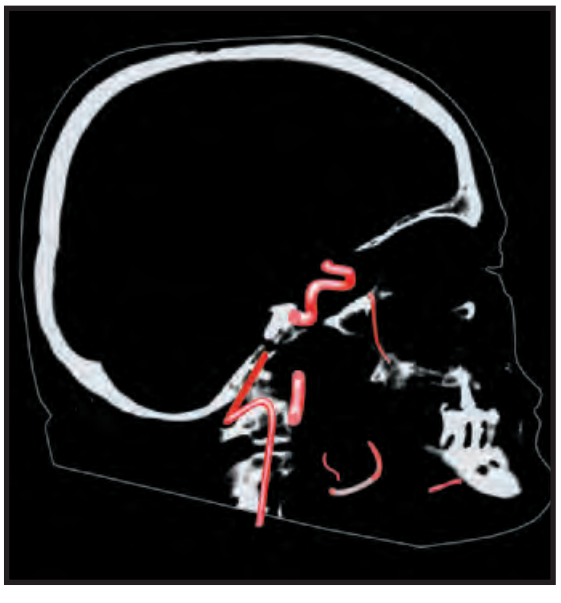
Remainder explained in Index of Abbreviations

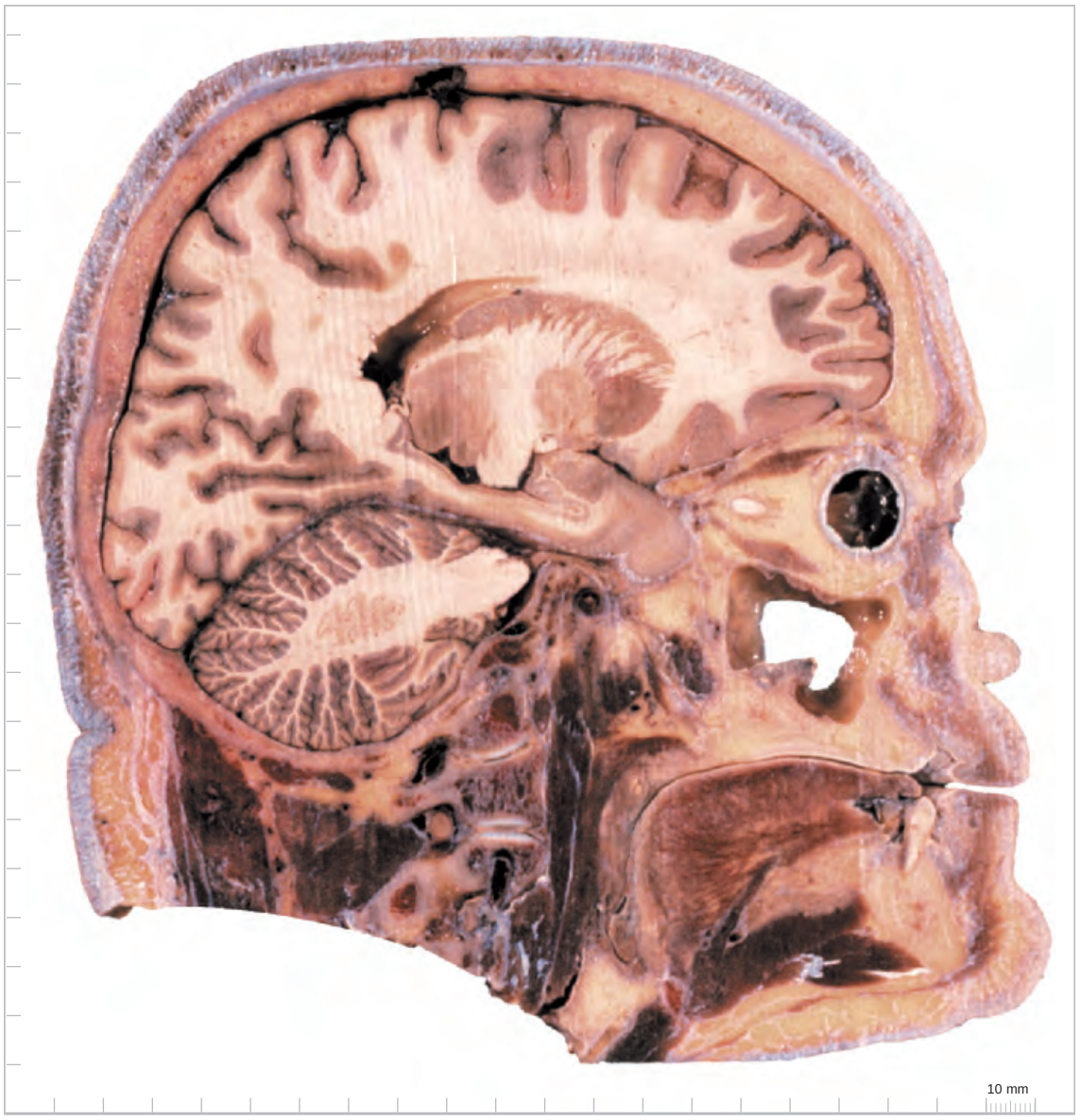
6

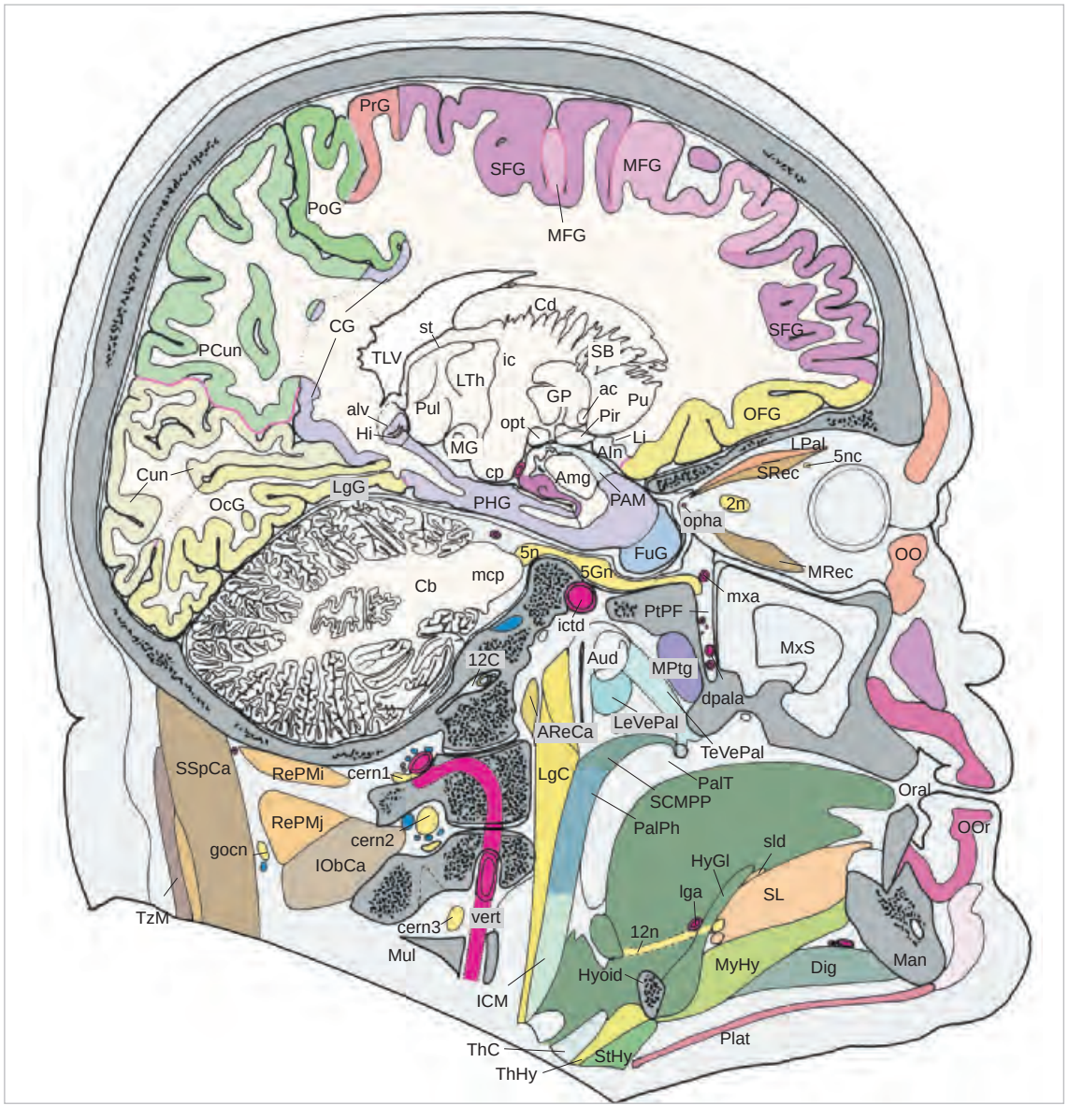
(medial view)

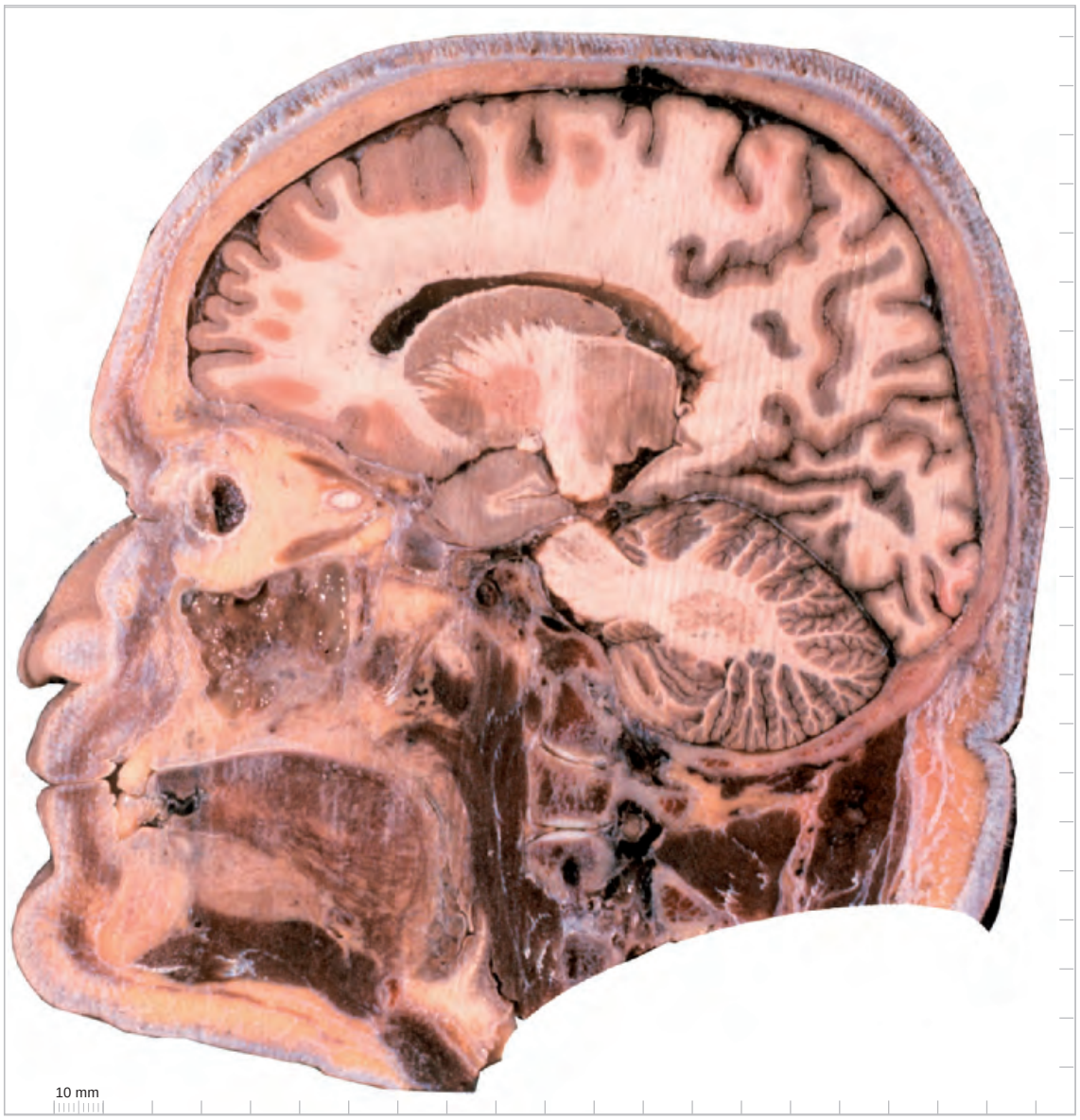


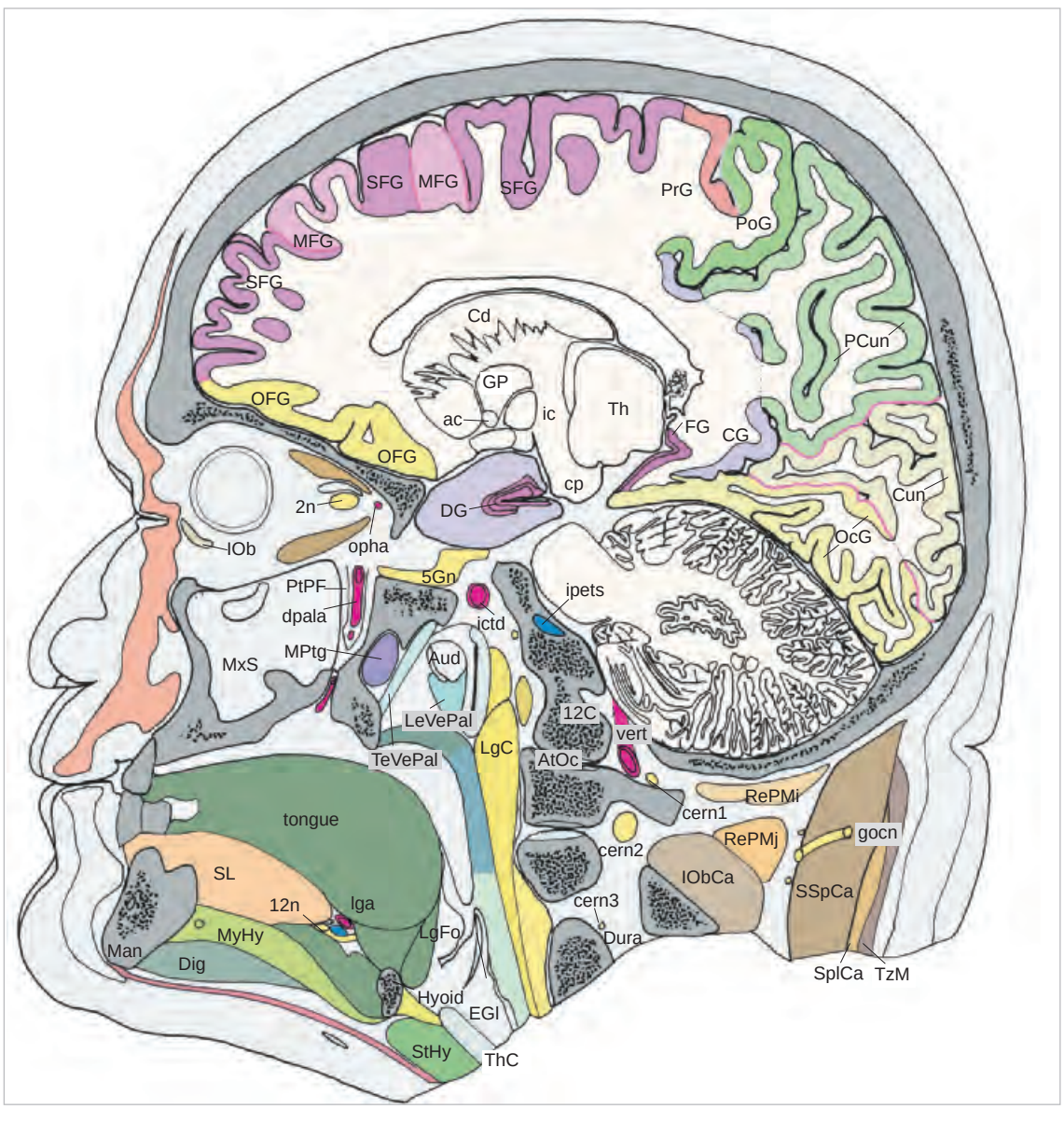












7

(lateral view)

Intracranial structures:

5n	trigeminal nerve
ac	anterior commissure
AIn	agranular insular cortex (claustro-cortex insularis)
alv	alveus of hippocampus
Amg	amygdala
Cb	cerebellum
Cd	caudate nucleus
CG	cingulate gyrus
cp	cerebral peduncle
Cun	cuneus
DG	dentate gyrus
FG	fasciolar gyrus
FuG	fusiform gyrus
GP	globus pallidus
Hi	hippocampus
ic	internal capsule
ipets	inferior petrosal sinus
LgG	lingual gyrus
Li	limen insulae
LTh	lateral thalamic nuclear region
mcp	middle cerebellar peduncle
MFG	middle frontal gyrus
MG	medial geniculate nucleus
OcG	occipital gyri
OFG	orbitofrontal gyri
opt	optic tract
PAM	periamygdaloid cortex
PCun	precuneus
PHG	parahippocampal gyrus
Pir	piriform cortex
PoG	postcentral gyrus
PrG	precentral gyrus
Pu	putamen
Pul	pulvinar
SB	striatal cell bridges
SFG	superior frontal gyrus
SPL	superior parietal lobule
st	stria terminalis
Th	thalamus
TLV	temporal horn of lateral ventricle

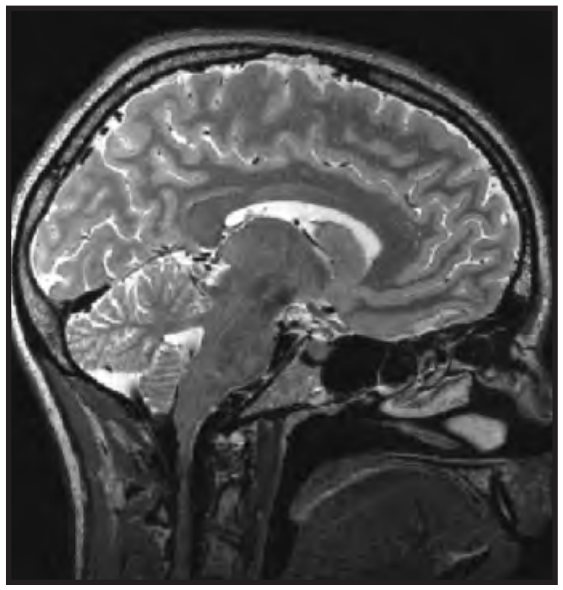
Peripheral structures:

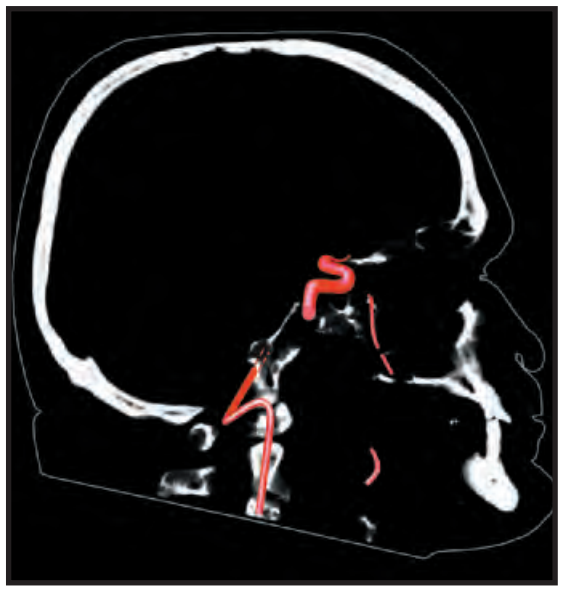
2n	optic nerve
5Gn	trigeminal ganglion
5nc	nasociliary nerve
12C	hypoglossal canal
12n	hypoglossal nerve
AReCa	anterior rectus capitis muscle
AtOc	atlanto-occipital joint
Aud	auditory tube
cern (1-3)	cervical nerve (1-3)
Dig	digastric muscle, ant. belly
dpala	descending palatine artery
EGl	epiglottis
gocn	greater occipital nerve
HyGl	hyoglossus muscle
Hyoid	hyoid bone
ictd	internal carotid artery
IOb	inferior oblique muscle
IObCa	inferior oblique capitis muscle
lga	lingual artery
LeVePal	levator veli palatini muscle
LgC	longus capitis and colli muscles
LgFo	lingual follicle
LPal	levator palpebrae superioris muscle
MPtg	medial pterygoid muscle
MRec	medial rectus muscle
Mul	multifidus muscle
mxa	maxillary artery
MxS	maxillary sinus
SCMPP	superior constrictor of the pharynx, pterygopharyngeal part
StHy	sternohyoid muscle

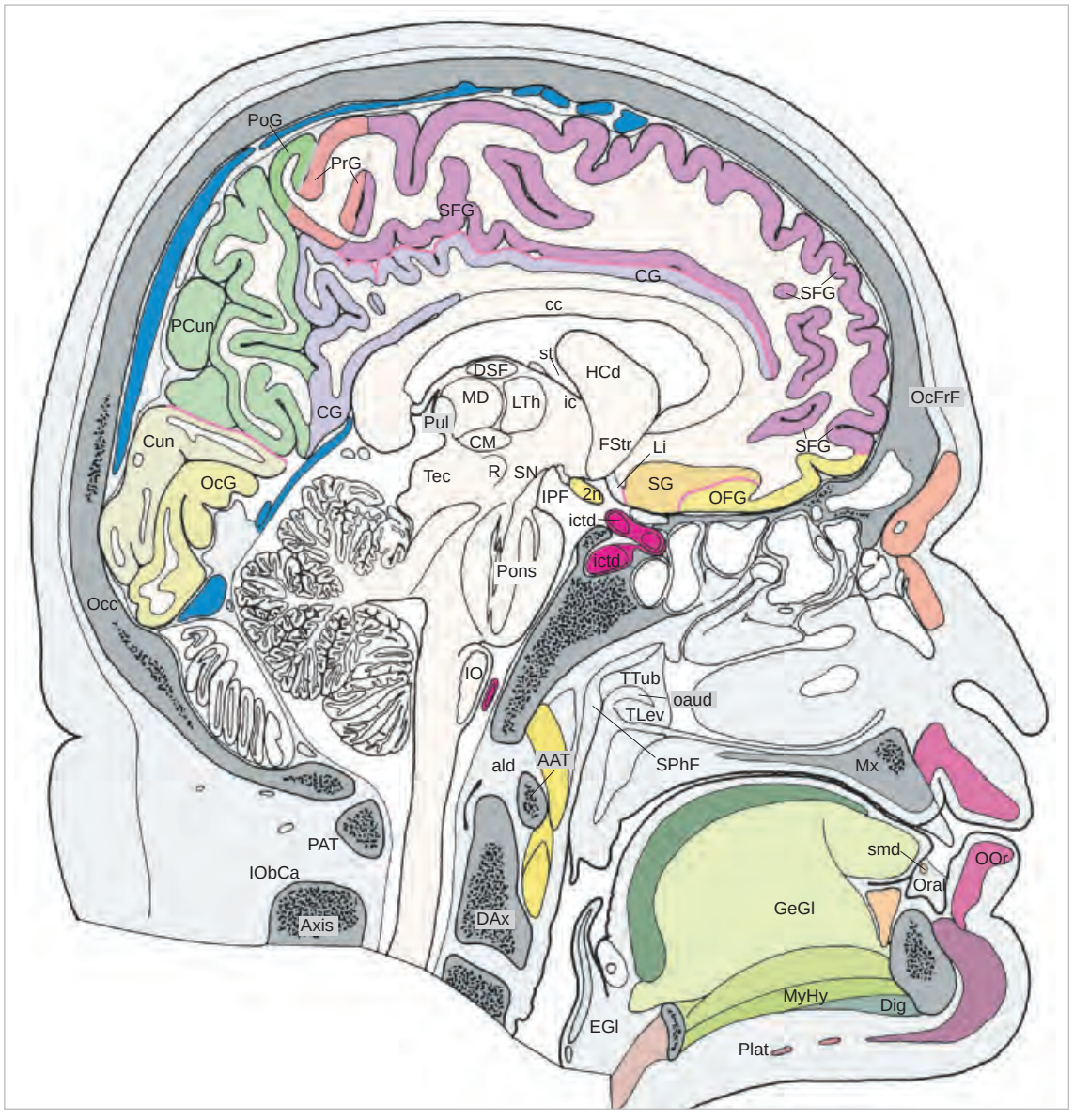
Remainder explained in Index of Abbreviations

7

(medial view)





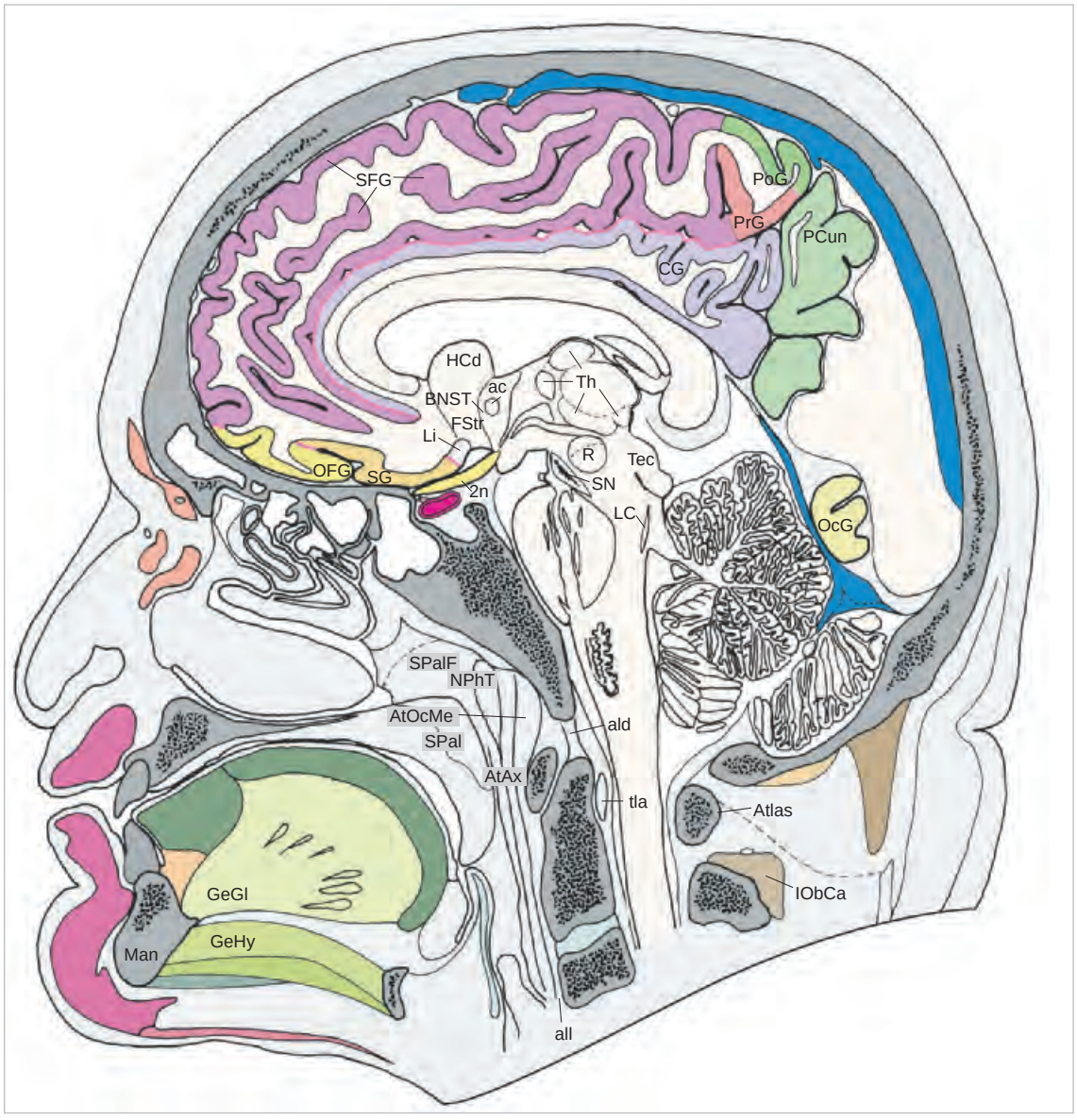


8

(lateral view)

Intracranial structures:

2n	optic nerve
ac	anterior commissure
BNST	bed nucleus of the stria terminalis
cc	corpus callosum
CG	cingulate gyrus
CM	centromedian thalamic nucleus
DSF	dorsal superficial nucleus
FStr	fundus striati
HCd	head of caudate nucleus
ic	internal capsule
IO	inferior olive
IPF	interpe duncular fossa
LC	locus coeruleus
Li	limen insulae
LTh	lateral thalamic nuclear region and reticular nucleus
MD	mediodorsal thalamic nucleus
OcG	occipital gyri
OFG	orbitofrontal gyri
PCun	precuneus
PoG	postcentral gyrus
Pons	pons
PrG	precentral gyrus
Pul	pulvinar
R	red nucleus
SFG	superior frontal gyrus
SG	straight gyrus
SN	substantia nigra
st	stria terminalis
Tec	tectum of midbrain
Th	thalamus

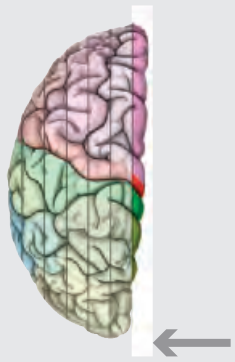


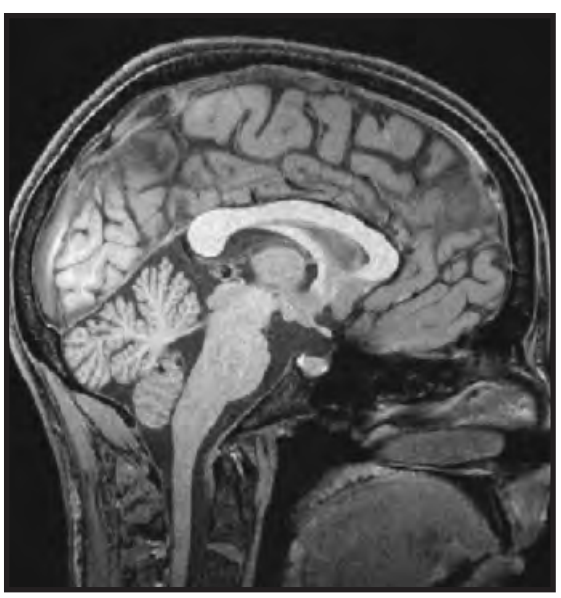
Peripheral structures:

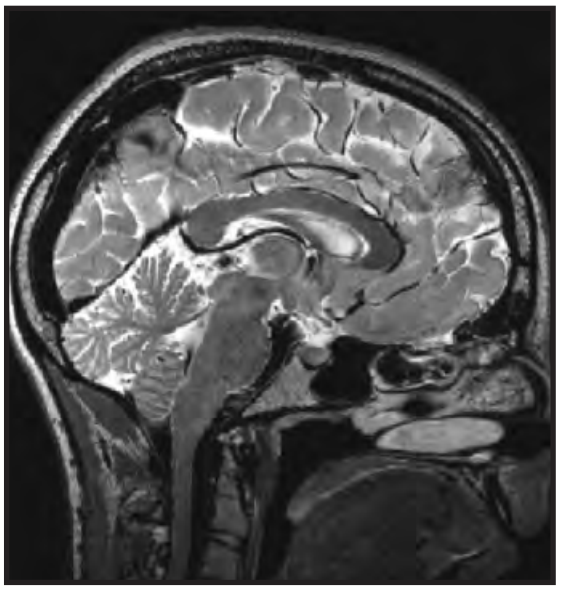
AAT	anterior arch of atlas
ald	apical ligament of dens
all	anterior longitudinal ligament
AtAx	altanto-axial membrane
Atlas	atlas
AtOcMe	atlanto-occipital membrane
Axis	axis
DAx	dens axis
Dig	digastric muscle
EGl	epiglottis
GeGl	genioglossus muscle
GeHy	geniohyoid muscle
ictd	internal carotid artery
IObCa	inferior oblique capitis muscle
Man	mandible
Mx	maxilla
MyHy	mylohyoid muscle
NPhT	nasopharyngeal tonsil
oaud	opening of auditory tube
Occ	occipital bone
OcFrF	occipito-frontal muscle, frontal belly
OOr	orbicularis oris muscle
Oral	oral cavity
PAT	posterior arch of atlas
Plat	platysma
smd	submandibular duct
SPal	soft palate
SPalF	salpingopalatine fold
SPhF	salpingopharyngeal fold
tla	transverse ligament of atlas
TLev	torus levatorius
TTub	torus tubarius

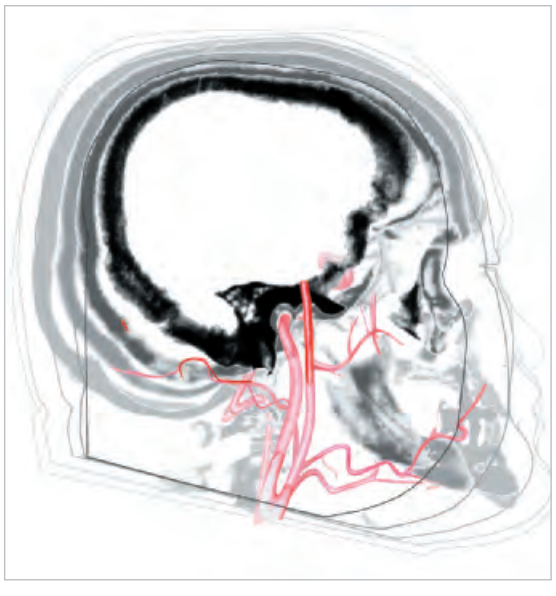
8

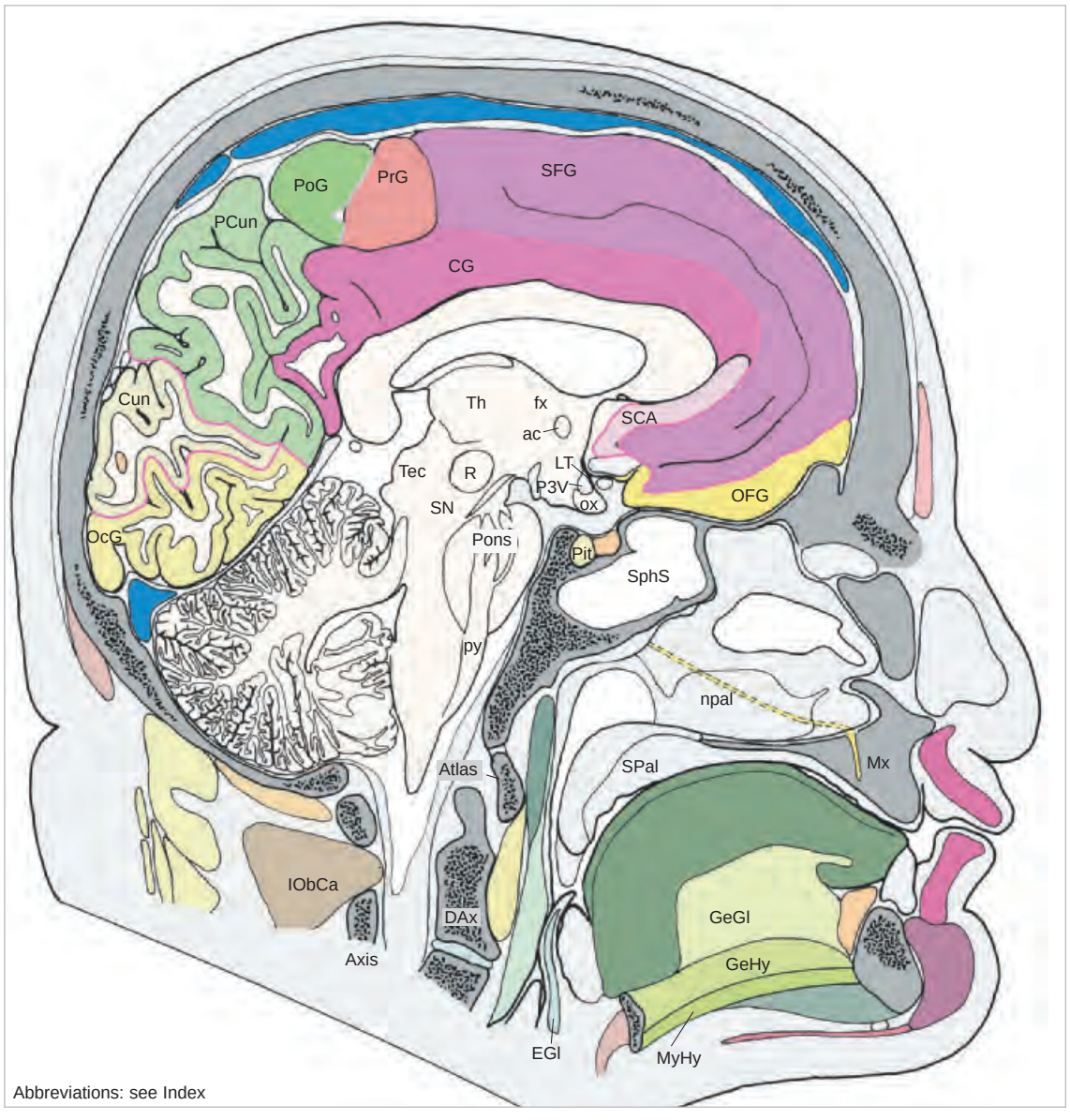
(medial view)











Abbreviations: see Index

Part 2: Atlas of the Human Brain in Stereotaxic (MNI) Space

2.1 Material and Methods

2.1.1 The Brain

The *Atlas of the Human Brain in Stereotaxic (MNI) Space (AHB)* is based on the right hemisphere of a 24-year-old male (1905-1929). The cause of death was hypovolemic shock and the death to fixation interval was 3 hours. This brain belongs to the Vogt-collection of Düsseldorf. The brain weight at autopsy was 1383 g, the fresh volume was 1316.3 cm^3 (see more details in Published Studies, Section 2.6). The values of some linear measurements for the fixed brain are given in Fig. 2.2. The external morphology of the formalin-fixed brain is shown on pages 95 to 97. This brain was selected because it was sectioned well and stained well by the great anatomists Oscar and Cécil Vogt and has been studied in the ensuing years by a number of scientists, including the Vogts, H. Brockhaus, R. Hassler, W. Wahren, F. Sanides and A. Hopf. In this *Atlas* we display the mylo- and cytoarchitecture of the right brain hemisphere accompanied by detailed diagrammatic delineations.

2.1.2 Methods

Histological Procedures:
The brain was cut by O. Vogt into five blocks oriented vertically to the intercommissural plane before being embedded in paraffin. Serial frontal (coronal) sections of 20 µm thickness were prepared. Most sections were stained with either cresyl violet or hematoxylin. Some additional sections remained unstained and we processed them immunohistochemically (e.g., substance P; see Section 2.6). Since the first and the last paraffin sections of each block were only partially recovered, we have drawn the approximate outlines of these sections by using photographs of the cut surface of the individual blocks, which were taken before sectioning.

Estimates of Volume Changes:
Volume changes occurring during autopsy, fixation and embedding in paraffin provide major obstacles in comparing sections with the *in vivo* condition. In the *Atlas* brain, the volume changes due to formalin fixation are negligible because the brain volume at the fixation time corresponds to the values determined at autopsy (Longerich, 1989). It is, therefore, reasonable to assume that the dimensions of the formalin fixed brain (Fig. 2.2) represent the *in vivo* condition. The overall volumetric changes that occurred during the histological preparation (due to dehydration, paraffin embedding, cutting, and mounting of the sections) were calculated in two ways: first, by estimating the extent of shrinkage artefacts on scaled photographs. The 1:1 scaled photographs of the surface views of the fixed brain and of the block-face were correlated with the histological sections. The transformation of the histological sections according to the shrinkage calculated revealed no appreciable nonlinear changes (Sievert, 1992). Second, by determination of the differences in the linear dimensions between the fixed, unembedded hemisphere (scaled photographs) and the serially sectioned hemisphere (Lange and Thörner, 1974) (see Section 2.6).

For application as a reference brain, inter-individual variability and shrinkage artefacts are the foremost variables that must be considered. The degree of shrinkage artefacts revealed no appreciable nonlinear changes (Sievert, 1992). Therefore, we are confident that our image data meet the condition of a reference atlas, hereby providing detailed histological data.

2.1.3 Earlier Histological, Morphometric and Immunohistochemical Studies

Numerous descriptive and quantitative studies were performed on sections from the brain represented in the *Atlas*. The relevant descriptive studies and morphometric data (fresh volume, volume of serial sections, numeric cell density, volumetric cell density, and absolute cell numbers of cortical divisions and subcortical nuclei) have been listed together with references in Section 2.6. Please note, that in several publications features or data of this brain were compared to other brains. Full text of most of these studies is found on the free website: www.thehumanbrain.info in an editable format.

2.1.4 Nomenclature

Considering the obvious need for a stable neuroanatomical nomenclature, we have decided to use the abbreviation system of Paxinos and colleagues because it is consistently used in atlases of various animals, used by many experts in the field of neuroscience and in the companion volume of this atlas, “The Human Nervous System” (Mai and Paxinos, 2012).

2.1.5 Photographic Plates and Corresponding Diagrams

The Atlas contains:
• 99 photographs of sections stained for myelin juxtaposed by 99 detailed diagrams.
• 50 photographs of sections stained for cell bodies, interposed at half the frequency of the myelin series. All photographs and diagrams are adjusted to the MNI stereotaxic space (see below).

The magnification of the photographs is higher than the diagrams because in this way the photographs can be bled for the sake of greater resolution. Rostral to the genu of the corpus callosum and caudal to the splenium we used higher and varying magnification, dictated by the availability of space. Between these two levels we kept the magnification constant.

The cell stained (Nissl) sections are not diagramed but are accompanied by high resolution photographs of cortical areas on the facing page of full page Nissl sections. These areas were selected to fit those depicted and described in the work of von Economo and Koskinas (1925). This provides the possibility to compare the histological features of the closely corresponding regions and to read the very detailed descriptions which accompany their photographs.

Additionally, the cortical cytoarchitectonic ribbon is unfolded and presented linearly as “stripes” in registration with the interpretation of earlier authors as we perceive their work (Section 2.14). Because any position within these stripes has a precise relation to the coordinates of the MNI-space, delineations of cortex areas derived from other classes of research can be registered. By this option any region of interest can be mapped within these stripes and compared with existing entries.

2.1.6 Three-Dimensional Reconstructions

For the 3-D analysis we used “contour-lines” to define pial and ventricular surfaces, borderlines around identified nuclei and their subdivisions (e.g. basal ganglia, amygdala, basal nuclear complex, hypothalamus and thalamus), and delineations of some compact fiber tracts (optic tract, anterior commissure, h1- and h2-fascicles, inferior thalamic peduncle) from 385

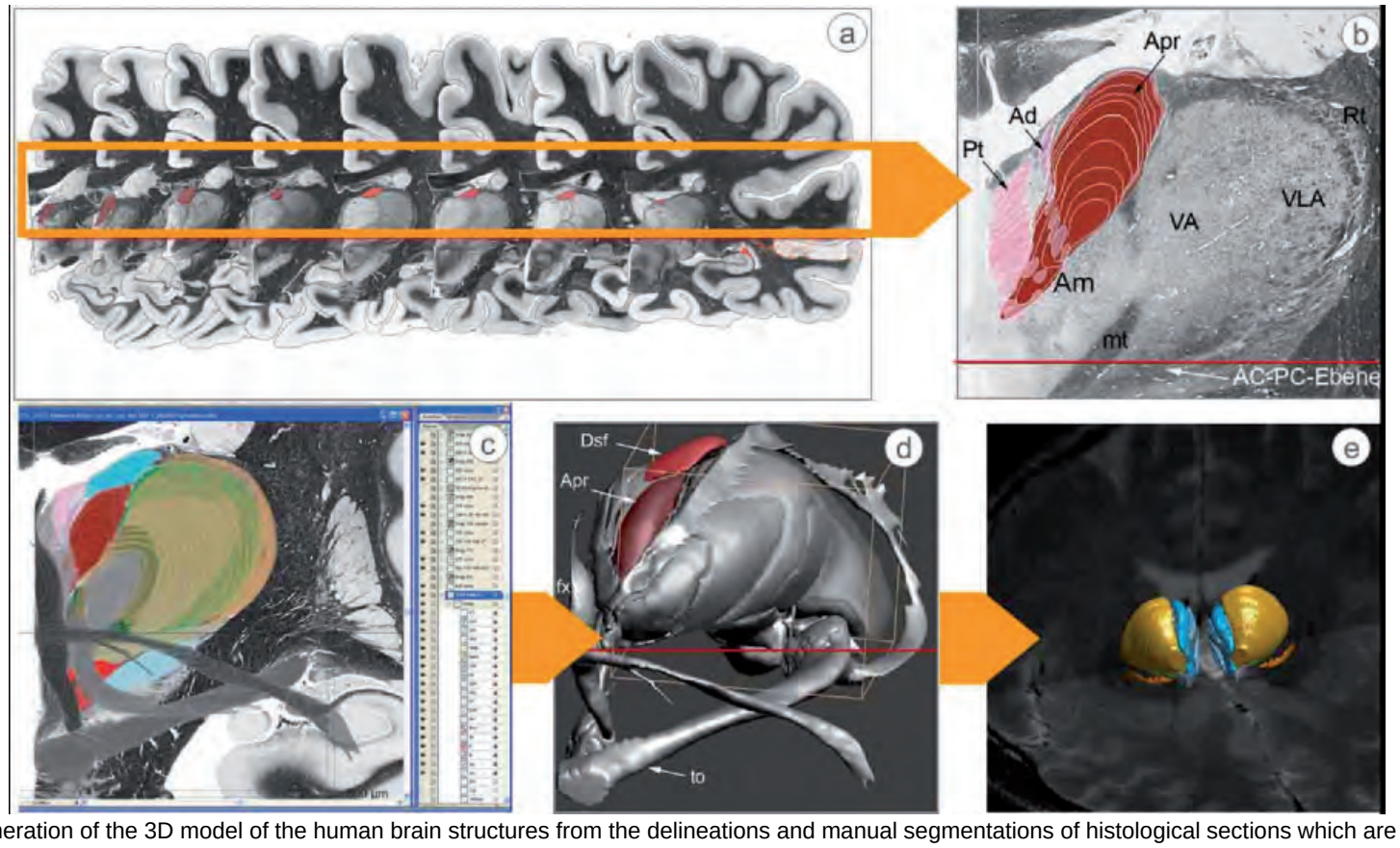


Figure 2.1. Generation of the 3D model of the human brain structures from the delineations and manual segmentations of histological sections which are represented in the *Atlas*. (a) Sections from the *Atlas* are aligned in the stereotaxic space and the borders of the nuclei of the anterior group of the thalamus are defined. (b) The cross-section areas of the anterior nuclei and of the paratenial nucleus located in front of the plane of the depicted myelin section (considering steadiness and consistency of the borderlines of neighboring sections). (c) Representation of relevant neighborhood relations. (d) 3D model of the anterior nuclei and their topographical situation. (e) The 3D model embedded within the MNI space (modified from Mai and Forutan, 2012).

sections of one hemisphere (Fig. 2.1). The correct segmentation of individual structures was not derived from a single class of research. We considered results from a range of conventional and immuno-stained sections from many other brains, including evaluations of more than 50 developing brains and a large number of brain sections from Pathology and from the Vogt-collection. We have always respected the results from the numerous cyto- and myeloarchitectonic studies that were previously performed on the represented brain and have used as often as possible the original delineations provided by these earlier workers. Generally, the consistency of the drawings, section-to-section, was of higher importance than a precise correspondence between the photographs and the drawings.

For each model structure separate voxel and surface representations were constructed (Mai and Majtanik, 2013). This reconstruction became embedded into the 3D template of the human brain developed from the *"3D- Atlas of the Human Brain"* (3D-AHB) (Mai and Majtanik, 2014).

2.1.7 Standardization

Our *Atlas* uses a reference system where the brain space is defined metrically with the zero point (= point 0/0/0) for all three dimensions being the center of the anterior commissure (Fig. 2.3a). The morphologic data of the hemispheres, therefore, are handled as coordinate points in this 3-D (metric) grid as X- (mediolateral), Y- (vertical), and Z- (fronto-occipital) coordinates (Fig. 2.3b). Scaling of the photographs and accompanying diagrams are accordingly provided in metric coordinates.

Data and Measurements:
The major linear dimensions of the *Atlas of the Human Brain (AHB)* are provided in Fig. 2.2. We defined the stereotaxic space by the midsagittal plane and the perpendicular plane which passes through the center of the anterior and posterior commissures, respectively (Assheuer et al., 1990). We have used the plane through the centers of the commissures (intercommisural plane, ICP) because of its established use in neurosurgery and its easier definition if compared with points at the limiting border of each commissure (see Tamraz and Comair, 2000). The vertical planes (VAC, VPC) pass through the centers of the anterior and posterior commissure, respectively. The distance between VAC and VPC is 28 mm.

This stereotaxic coordinate system can be directly spatially registered to the dimensions of alternative coordinate spaces e.g. the Talairach Atlas or the MNI/ICBM templates.

2.1.8 Mapping of the *Atlas* Space to the Talairach-Space

In order to facilitate the comparison of the original Talairach structural labelings, effort has been made to transform the dimensions of this individual brain to the Talairach stereotaxic space (Talairach and Szikla, 1967; Talairach and Tournoux, 1988). In the last edition of our *Atlas of the Human Brain* (2008) we have applied linear transformation of the *Atlas* brain into the Talairach and Tournoux (T&T) standard proportional grid system. This approach is problematic for several reasons. First, the *Atlas* was prepared from the brain of a 24 year old male person; the T&T atlas is based on the brain of a 60 year old female. Second, not all linear dimensions of the *Atlas*- and the T&T-brains are exactly congruent. As illustrated in Fig. 2.2 the linear mediolateral and fronto-occipital dimensions of the formalin-fixed *Atlas* brain correspond to those of the T&T-brain. The vertical dimension, however, is reduced with respect to the distance below and above the ICL (Sievert, 1992). Third, the distances of the stereotaxic grid along the orthogonal planes have different values with respect to the Talairach space reported 1967 and 1968, respectively. Finally, and most important, is the use of different baselines (see below).

To make the linear dimensions between both atlases directly comparable, we have adjusted the vertical dimension of the *Atlas*-brain to that of the T&T-brain (Fig. 2.2). In the first edition of the *Atlas* (1995), we showed two scalings on the schematic diagrams, indicating the different dimension as illustrated by the green arrows in Fig. 2.2. One scale provided the vertical dimension of the stained histological sections, the other the calculated dimensions according to the standard dimensions of the T&T space. In the last edition (2008), we showed the diagrams in the (transformed) dimension of the T&T space. The photographs of the myelin-stained sections remained without linear distortion and showed the original, unchanged dimension.

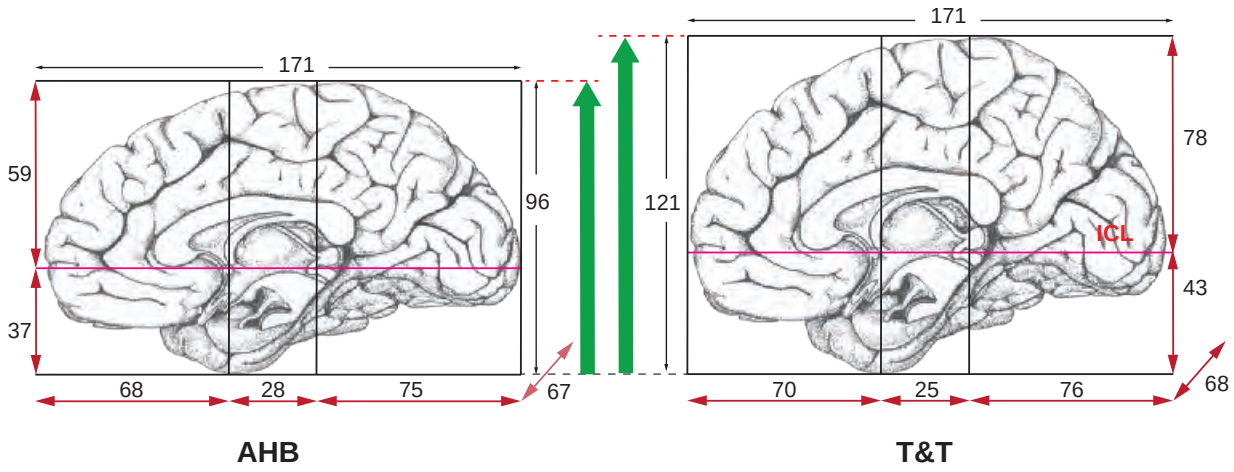


Figure 2.2. Graphic representation of the formalin-fixed *Atlas* brain before embedding (left) and after transformation into the Talairach and Tournoux standard proportional grid system (right). The linear dimensions of the orthogonal reference lines (in mm) are indicated. The linear anterior-posterior and medio-lateral dimensions of the formalin-fixed brain correspond well to the values of the Talairach space. The vertical dimension is, however, reduced (green arrows) (Sütfels, 2011).

If maps from the *Atlas*- and the T&T-brain are compared at the same section levels, differences in various areas are obvious (Fig. 2.4). These result from the different slopes of the stereotaxic baseline used for the standardization procedure. The *Atlas* space is based on the intercommissural line (ICL), which passes through the centers of the anterior (AC) and posterior (PC) commissure, respectively. The vertical line of the anterior commissure (VAC) extends orthogonally through the center of the AC (Assheuer et al., 1990). The T&T space is based on the bicommissural line (BCL). This line connects the upper border of the anterior commissure with the lower border of the posterior commissure. VAC and VCP orient perpendicular to the BCL from the posterior and anterior margins of the AC and PC, respectively (Fig. 2.3.a). Consequently, the zero point (intersection of the commissural line and VAC) of both coordinate systems locate differently (center of AC versus posterior margin of AC). Distance values between both commissures and especially the representation of section content are different.

Fig. 2.3a demonstrates the differences in the geometry of both systems and the main consequences:

- The origin of the coordinate system is different. That leads to a shift of corresponding coordinate points. For example, the values for the AC-PC distance differ albeit the actual distance is equal. If the diameter of the anterior commissure is calculated with 2-3 mm, the coordinate zero-point of the T&T-Atlas is 1 to 1.5 mm posterior. This is the distance, by which structures along the anterior-posterior axis are shifted.

- The different slope of the commissural lines (ICL or BCL) leads to a different representation of the frontal plane (Fig. 2.4).

- The limited matching between the histological features from both atlases is best visualized if actual sections with the same coordinate points are compared. Fig. 2.4 shows the consequences with respect to the dimension and content illustrated at three section levels: in front of the anterior commissure, between both commissures and posterior to the posterior commissure.

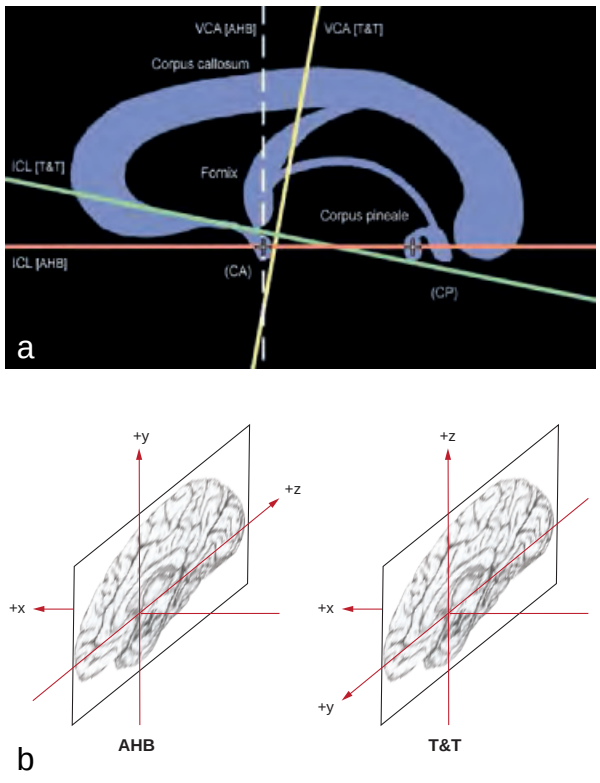


Figure 2.3. a) Comparison between the intercommissural line (ICL) and the bicommisural line (BCL) and the consequence with respect to the orthogonal frontal section plane. b) The orientation between both stereotaxic frames of the AHB and the T&T is different (Sütfels, 2011).

The overlays of diagrams taken from the T&T-atlas and from this *Atlas* at corresponding levels along the fronto-occipital axis (y in the T&T-; z in the *Atlas* brain) illustrate that the different slope of the BCL in the T&T and of the ICL in the *Atlas* brain results in a shift along the vertical axis of each image pair that is dependent in extent from the distance from the crossing point of the two baselines (ICL and BCL) (Fig. 2.4). The figures demonstrate that the different geometry due to the standardization protocols used precludes the direct correspondence of coordinates (ROIs), especially distant to the mid-commissural point. The discrepancy between the Talairach coordinates and those from the *Atlas* makes the correlation of ROIs with anatomic structures difficult and therefore not all published coordinates refer to the same neuroanatomical region (Sütfels, 2011). However, since the Talairach coordinates can be converted into MNI coordinates (Lancaster et al., 2007; Laird et al., 2010) this platform provides the possibility for (indirect) comparison with our *Atlas* in the MNI space (see below).

Because of the limitations ensuing from comparison between our *Atlas* and the atlas from Talairach and Tournoux (1988) we have in this edition tried to compare the *Atlas* with the information provided by the MNI standard space.

2.1.9 Mapping of the *Atlas* Space to the MNI/ ICBM2009b Template

The MNI defines a new standard brain by using a large series of MRI scans on normal controls. The MNI152 6th generation standard space consists of multiple linear and nonlinear averages of 152 normal MRI scans from the MNI152 database that were transformed into a symmetric model in the Talairach space (Collins, 2012; Evans et al., 1992, 1993). The new MNI/ICBM2009 spaces are a set of unbiased non-linear averages of the MNI152 database with both high-spatial resolution and high signal-to-noise ratio. This space is not biased by the deviations of any single brain (Fonov et al., 2011).

The construction of MNI/ICBM2009 involved multiple iterations of a process where, at each iteration, individual MRIs were non-linearly fitted to the average template from the previous iteration, starting with the MNI152 linear template. Furthermore, a specific age-based subpopulation of subjects became created. The scans within each group were then automatically re-registered to the stereotaxic space target template with an iterative nonlinear co-registration algorithm applied to obtain the group averages (Fonov et al., 2011).

In the present edition of the *Atlas* registration was made to comply with the MNI space (see Fig.2.5). Not only the diagrams but also the photographs of the original histological brain sections were nonlinearly registered to fit that space with respect to its dimensions.

The MNI brain is significantly different in shape compared with the *Atlas* brain. The MNI template is larger than the *Atlas* brain, especially along the dorso-ventral

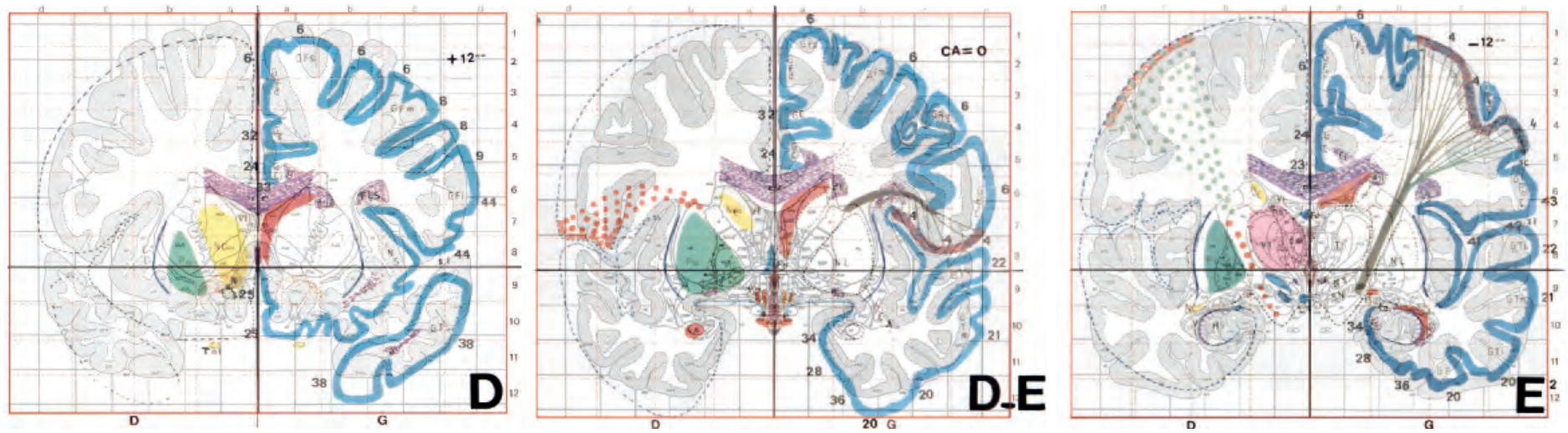


Figure 2.4. Topographic correlation of images from the Talairach atlas and from the *Atlas* brain. The different slopes of the baseline (ICL and BCL) of the standardization protocols yield a shift along the vertical axis of both image spaces that is dependent in extent from the distance from the crossing point of the two baselines (compare to figure 2.3a). This precludes direct correspondence of coordinates (ROIs). (a) Corresponding section planes located 12 mm anterior to the AC. Panel D (y = +12 mm) of the T & T overlaid to the *Atlas* plate 22 (z = -12.5 mm) of the AHB. The plane of section is 12 mm anterior to the anterior commissure. The image visualizes the effect of the increasing distance between the BCL (T & T) and ICL (AHB). The outer contours and subcortical structures show a generally good congruence between the T & T and the *Atlas* templates. However, of the outer contours (broken line) and the location of the putamen (green) and caudate nucleus (yellow) of the T & T panel are shifted ventrally if both images are aligned on the ICL. (b) Panel D_E (y = 0 mm) of the T & T and corresponding panel 32 (z = 0.0 mm) of the AHB at the center of the anterior commissure. The superimposed diagrams from both atlases show a good agreement of the subcortical structures; the outer brain contours, however show appreciable differences. (c) Overlay of panel E (y = -12 mm) of the T & T and the corresponding plate 44 (z = 13.3 mm) of the AHB. Rather good congruence of the superimposed diagrams due to the location of both diagrams at the point of intersection of the ICL and the BCL, respectively (adapted from Sütfels, 2011).

axis by about 30 mm and along the anterior-posterior axis by about 10 mm. In the MNI space the center of the anterior commissure (AC) is about 4.5 mm more ventral and 2.5 mm more anterior than the origin [0,0,0] of the MNI template (MNI AC coordinates = [0, -2.5, -4.5]) (Fig.2.5b). It is also noteworthy that the ICL plane is not exactly horizontal.

Due to the restriction of the deformation fields for the slice-to-slice reconstruction (slice orientation of the *Atlas* is constant) a perfect global conversion of 3D-AHB to MNI coordinates is somewhat complicated. Therefore we performed a two stage mapping of the *Atlas* to the MNI152/ ICBM2009b symmetric brain template provided by the Montreal Neurological Institute (MNI) (Mai and Majtanik, 2013). To this end a shape constrained 3D reconstruction of the *Atlas* has been created.

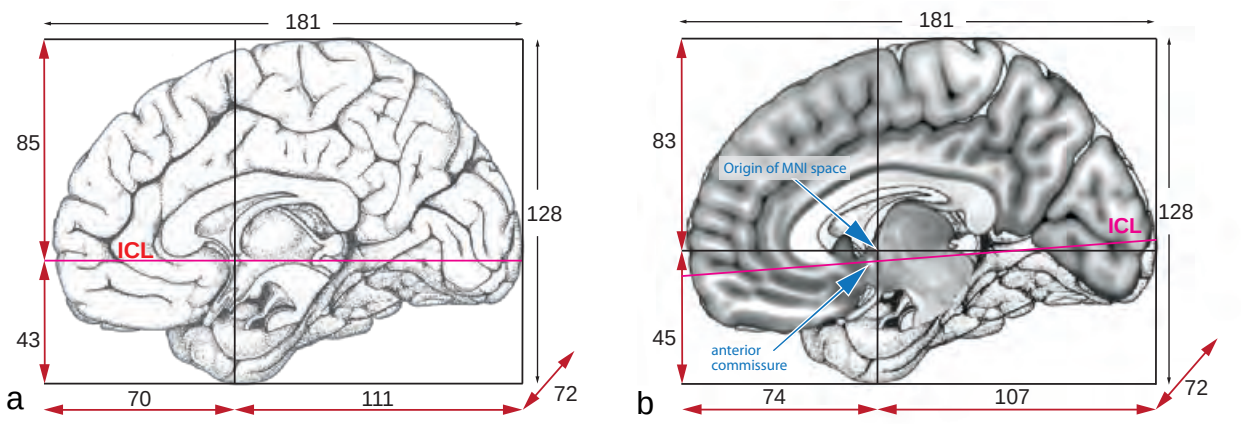


Figure 2.5. (a) Linear dimensions of the *Atlas* brain after transformation to the MNI-dimensions (AHB-MNI). (b) Composite showing the MNI template projected to the midsaggital view of the AHB-MNI. The blue arrows point to the x/y/z center of the coordinates of both stereotaxic spaces. MNI/ICBM2009b brain, ©1993–2004 Louis Collins, McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University.

2.1.10 AHB Reconstruction with MNI/ ICBM2009b Shape Constrain

The 3D reconstruction of the *Atlas of the Human Brain in Stereotaxic (MNI) Space (AHB)* was created from delineations of 358 coronal slices with maximal slice-to-slice distance of 0,4 mm. For the 3D reconstruction of the AHB we employed our novel geometric shape constrained 3D reconstruction algorithm for serial sections (Mai and Majtanik, 2014). This algorithm creates a specific 3D-AHB reconstruction such that it corresponds to the MNI/ICBM-2009b space. A single geometric shape constrain defines a homologous structure in the AHB and in the MNI brain that will be perfectly matched during the nonlinear part of the reconstruction process. The geometric constrains can be defined as a set of one, two or tree dimensional structures (1D, 2D or 3D constrains).

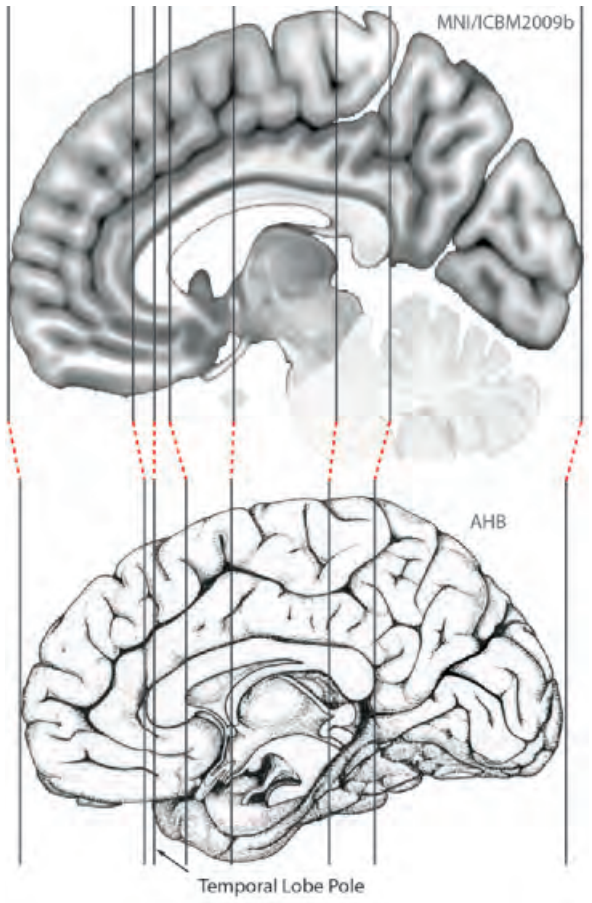


Figure 2.6 Corresponding landmarks between MNI/ ICBM2009b brain (top) and AHB brain (bottom). For the generation of the geometric shape constrains the following landmarks marked by black vertical lines were used: anterior-posterior extension of the brain, AC, PC, pole of the temporal lobe, and the extension of the corpus callosum. MNI/ICBM2009b brain: ©1993–2004 Louis Collins, McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University.

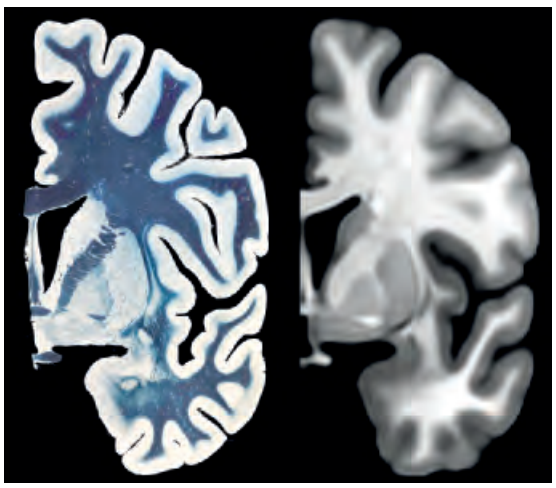
The 3D reconstruction was performed in 2 stages: the linear and the nonlinear stage. During the first stage we created a slice-to-slice linearly registered *Atlas* volume and a corresponding brain segmentation of the ICBM2009b brain. In this step 1D and 3D geometric constrains were defined (Fig. 2.6). The set of 1D landmarks consisted of the anterior-posterior extension of the brain, AC, PC, pole of the temporal lobe, and the extension of the corpus callosum. As 3D volume constrains we used the overall shape of the brain, ventricles, corpus callosum, optic tract, lateral and medial geniculate bodies, septum, mammillary bodies. Since the deformation fields during the slice-to-slice reconstruction are restricted to the 2D coronal plane we generated for each slice a corresponding slice from the 3D constrain volumes and used them in the next nonlinear step of the reconstruction.

The slice-to-slice registration was followed by a global nonlinear stage. Each slice was nonlinearly registered to the neighboring slices. Simultaneously, the geometric constrains for each slice were aligned. After the initial match a high resolution iterative optimization procedure was applied to ensure perfect match between

the geometric volumes and the structures of the *AHB*. We used an optimized sequence of tree multimodal measures during this high resolution step. The resulting 3D volume along with the corresponding MNI MRI slices were used to register the histological sections into the MNI/ISBM2009b space.

2.1.11 Registration of the Histological Sections to the Reconstructed Volume

Prior to the registraton an intensity correction algorithm was employed for optimization of the histological data accounting for staining inhomogeneities and deformations such as shearing, local compression, tearing. Missing parts of the slices were reconstructed either from neighboring slices or by means of inpainting algorithm. We have indicated the reconstructed areas by grey broken lines in the fiber-stained sections.
A total of 99 fiber and 50 cell stained



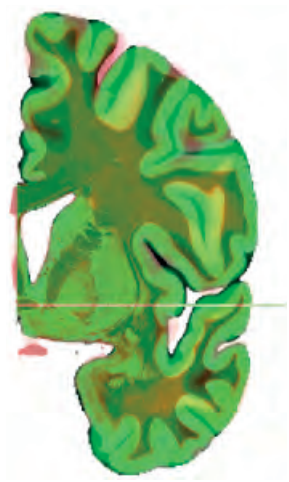


Figure 2.7. Myelin stained section (top left) at the level of the anterior commissure registered to the corresponding MNI slice (top right). Below: color coded composite of both images: myelin stained section (green), MNI slice (red). MNI brain; ©1993–2004 Louis Collins, McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University.

high resolution slices were registered to the 3D AHB reconstruction by means of the multimodal registration procedure. In the first step the slices were registered to the corresponding sections from the 3D reconstruction. The next step consisted of local high resolution multimodal registration of the subcortical part of the slice to the corresponding MNI section. For the registration of the plates to the MNI space we used a pseudo-grey level representation of the schemata.v

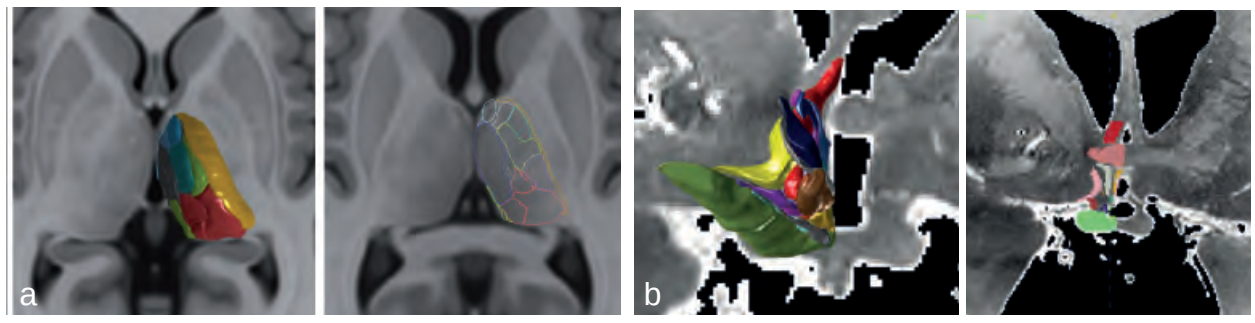


Figure 2.8. Examples of the automatic correlation between the histomorphologic and MR-image datasets. (a) Registration of the human thalamus model from Mai and Forutan (2012) to the MNI template. (b) Registration of the human hypothalamus model from Y. Koutcherov (see page 427) to a formalin fixed autopsy brain with severe pathological changes due to infarction. After transformation the borders of *Atlas*-regions are shown as overlay on the individual MR-images in any chosen plane. The precision of the registration can be controlled and can - if necessary - be interactively adjusted. This procedure uses no probability maps and preserves the original MR data. Therefore, the high original resolution by MRI is retained. Any point within the (individual) MR-brain can be back-registered by the transformation matrix to the *Atlas* brain and used for intra- and extramural communication. (Data from Mai and Majtanik, 2014).

2.1.12 Use of the Atlas for the Interpretation of Individual *in vivo* Brains

Figure 2.8 shows examples of the automatic correlation between the histomorphologic and MR-image datasets. For the *Atlas* being registrered to a standard MR-dataset an automatic two stage processing pipeline is used.

In the first stage the 3D *Atlas* template is registered to the target brain with standard 1mm resolution. This stage uses a T1-weighted and optionally a co-registered T2-weighted MR image of the patient's brain as an input. First, an automatic localization of the anatomical landmarks AC and PC derived from Pallavaram et al. (2009) is performed. In the next step image intensities are corrected and normalized. The preprocessing ends with an intensity-based segmentation of the brain (white and gray matter) and of the ventricles. Further, a standard resolution (1mm) *Atlas* registration is performed by three registrations with increasing degrees of freedom (DOF), rigid (6 DOF), affine (12 DOF) and non-linear diffeomorphic registration. Each registration type uses a coarse-to-fine approach and smooth-to-sharp refinement similar to the one described in Haegelen et al. (2013).

The accuracy and the robustness of the used algorithms are critical for the precision of the resulting *Atlas*-based segmentation. With the standard 1mm MR resolution the description details of the deformation fields are not sufficient. Therefore a second high resolution stage is executed. In the second stage a Gaussian volume mask corresponding to a region-of-interest (ROI) around the target and surrounding structures (thalamus, striatum, ...) are defined in the patients MR and in the *Atlas* template space. The ROIs are super-sampled to a resolution of 0.1 mm. The ROIs are co-registered using diffeomorphic registration algorithms (Beg et al., 2005). In this high resolution stage the results of the first stage are locally optimized with a sequence of multi-modal distance measures to perfectly match computer identified control volumes.

After the registration the borders of *Atlas*-regions are shown as overlay on the individual MR-images in any chosen plane and can - if necessary - become adjusted to relevant landmarks. This procedure uses no probability maps and maintains the original MR data. Therefore, the high original resolution by MRI is retained (Fig. 2.8).

Registration of the 3D-MRI into the MNI space facilitates the precise identification, localization and characterization of anatomical cortical and subcortical regions in MNI normalized datasets.

Because the transformation matrix is known any point within the MR-brain can be correlated to the *Atlas* brain. The 3D-AHB can thus serve as registry of the corresponding coordinates and as module for the integration of databank entries.

2.1.13 Mapping of the Cortex Areas

Since many reports of ROIs have been correlated with the Brodmann areas we have used these delineations for correlation with the histology of the brain sections.

Figure 2.9. Brodmann (1909) parcellations of the cortex surface-registered to the 3D-AHB. The 3D-AHB is shown in three different representations: fiducial, very inflated and as flat map. (Data from Mai and Majtanik, 2014).

Preparation of the Brodmann Areas: The photographs of the cell-stained sections and the schematic drawings show delineations of the cortex which are based on the original maps of Brodmann (1909). We have used the surface-based maps that were generated (in Caret) by Van Essen (Van Essen, 2005, Van Essen et al. 2012) but we have induced a modification by manually estimating areal boundaries on the *Atlas* brain and transferring them onto the surface of the 3D reconstruction.

The same procedure as for mapping the Brodmann areas has been applied for the registration of the von Economo and Koskinas surface-based maps. The resulting areal boundaries are not shown on the sections or diagrams but are indicated on the linear representation of the cortical ribbon ("stripes", Section 2.1.14).

The Brodmann and von Economo and Koskinas surface-based maps were generated by manually estimating areal boundaries on the 3D reconstructed *AHB* using as a reference the classical drawings from these authors. Further, the reconstructed *3D-AHB* was surface-registered to the PALS12 atlas of Van Essen by open source software Caret (Van Essen 2005, Van Essen et al., 2012). The Brodmann and von Economo and Koskinas parcellations of the cortex were then projected onto the flat map cortex representation of the *AHB*. The cortical parcellation of the cortex represented by the flatmaps of the PALS12 atlas was back-transformed to the *AHB* by means of inverse deformation fields.

Since the insula and the areal boundaries of the orbitofrontal cortex are not sufficiently delineated in the Brodmann map we have included the insula as defined by the circular sulcus and have used the delineations of Öngur et al. (2003) from the PALS12 atlas flat map representations for the parcellation of the orbital and medial prefrontal cortex (Öngur et al. 2003, Van Essen et al. 2012).

Flat Map Registration and Transformation to the Atlas Slices:
For the projection of the cortical parcellations to the 2D sections we generated a coronal section through the *3D-AHB* surface representation at the corresponding position. From the intersection of the surface with the coronal cutting plane a linear contour representation of the parcellation was generated and transferred to the histological section. For the schemata and Nissl stained sections the parcellations from Brodmann (1909) and Öngür et al. (2003) were adopted.

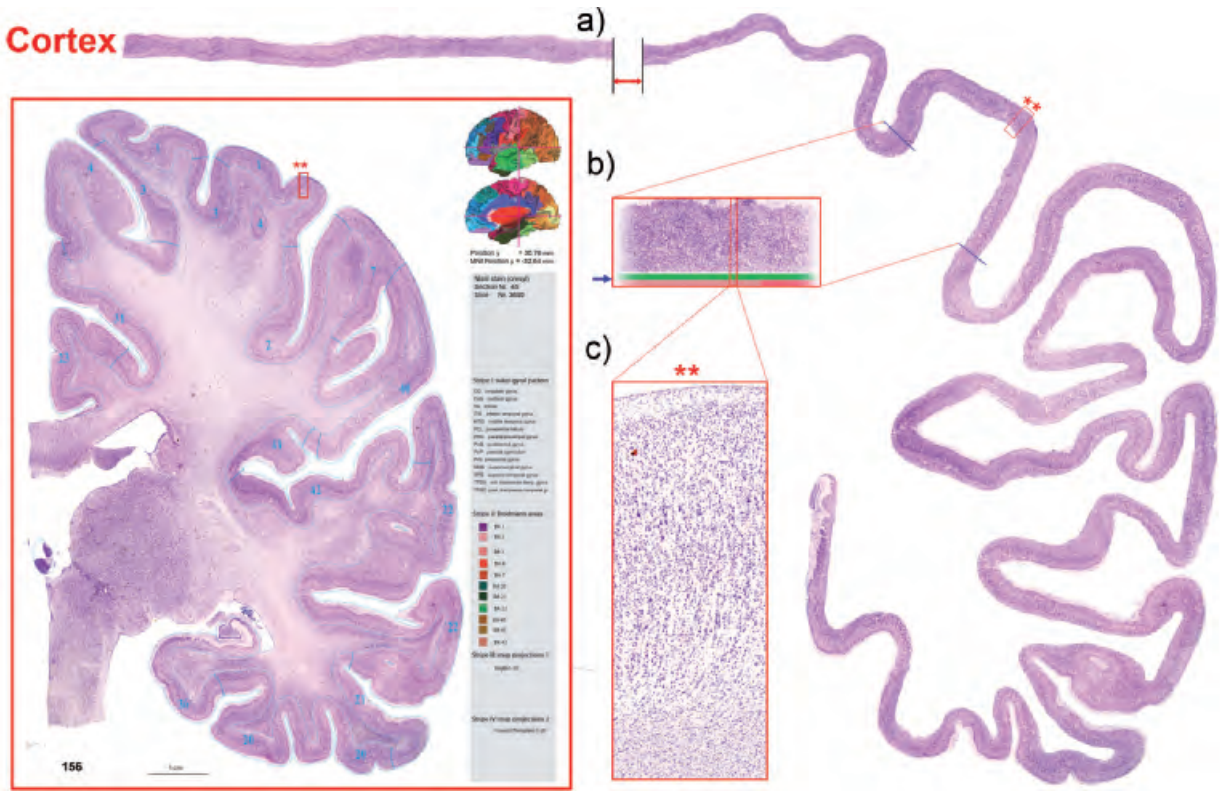


Figure 2.10. Linear representation of the cortex as „stripes". The left figure shows the MNI-registered cell-stained slice with delineated Brodmann areas. The right-sighted cartoon depicts the "unwrapping" of the cortex into stripes. The stripes are defined as straight bands of "unfolded" cortex together with parcellation bands (a). The stripe segment depicted in (b) represents the cortex between the two blue marking lines in (a). The small segment indicated be asterisks is shown at different magnifications in the left-sided figure and in a-c (red boxed area**.) Functional area delineations are shown at the bottom of the stripe at (b).

We are very aware that the representation of the borders indicating areal boundaries of "original" Brodmann areas is at present only best guess and needs confirmation or changes depending on more accurate methodological studies. This will be aided by additional features that update the structural and functional analysis of the sections:

(i) We make the the original cell- and fiber-stained sections available at high magnification in the internet (www.thehumanbrain.info).

(ii) On the facing page of each full page Nissl section we present photographs showing small sectors of cortical areas that are displayed at high magnification to allow the study of the cytoarchitectonic characteristics. We selected preferentially those areas which are thought to correspond with the photographs published by von Economo and Koskinas (1925). This has the advantage that their descriptions can be evaluated with respect to correspondence or conflicts. Thus, the user of the *AHB* can profit from their monumental work of more than 800 pages and their histological atlas.

(iii) As a novel way of depicting cortical areal pattern we show the cortical cytoarchitectonic ribbon unfolded in a linear presentation (see 2.1.10 and 2.2.12). This representation maintains the x/y/z coordinates of the brain space and allows the easy registration of the interpretation of other authors and of regions of interest provided by imaging techniques.

2.1.14 Generation of the Linear Representation of Cortex "Stripes"

For mapping, documentation and comparison between differing interpretations of cortex areas and inclusion of activation areas (ROIs) we produced linear representations of the cortex (Fig. 2.10).

The linearization is based on a solution of the Laplace equation between inner and outer contour, and resampling of the cortex along the traverses. We call this linear representation a *stripe*. The stripe is a band that represents equally spaced sampling of the cortex. For the *AHB* we present the stripe representations of the Brodmann and von Economo and Koskinas cortex parcellations supplemented by the parcellations of Öngür et al. (2003). We also show a stripe with the representation of the gyri and sulci which aides the orientation and localization of the areas involved. The presentation of linear cortex stripes adjusts the different regions of interest into common coordinates and allows easy comparison of different results reported at common coordinate points or regions.

2.1.15 The Layout of the *Myelo- and Cytoarchitectonic Stereotaxic Atlas in MNI Space*

The main part of the "*Myelo- and Cytoarchitectonic Stereotaxic Atlas"* consists of 99 fiber-stained (myelin) plates and their graphic interpretation, both mounted on facing pages (Fig. 2.11).

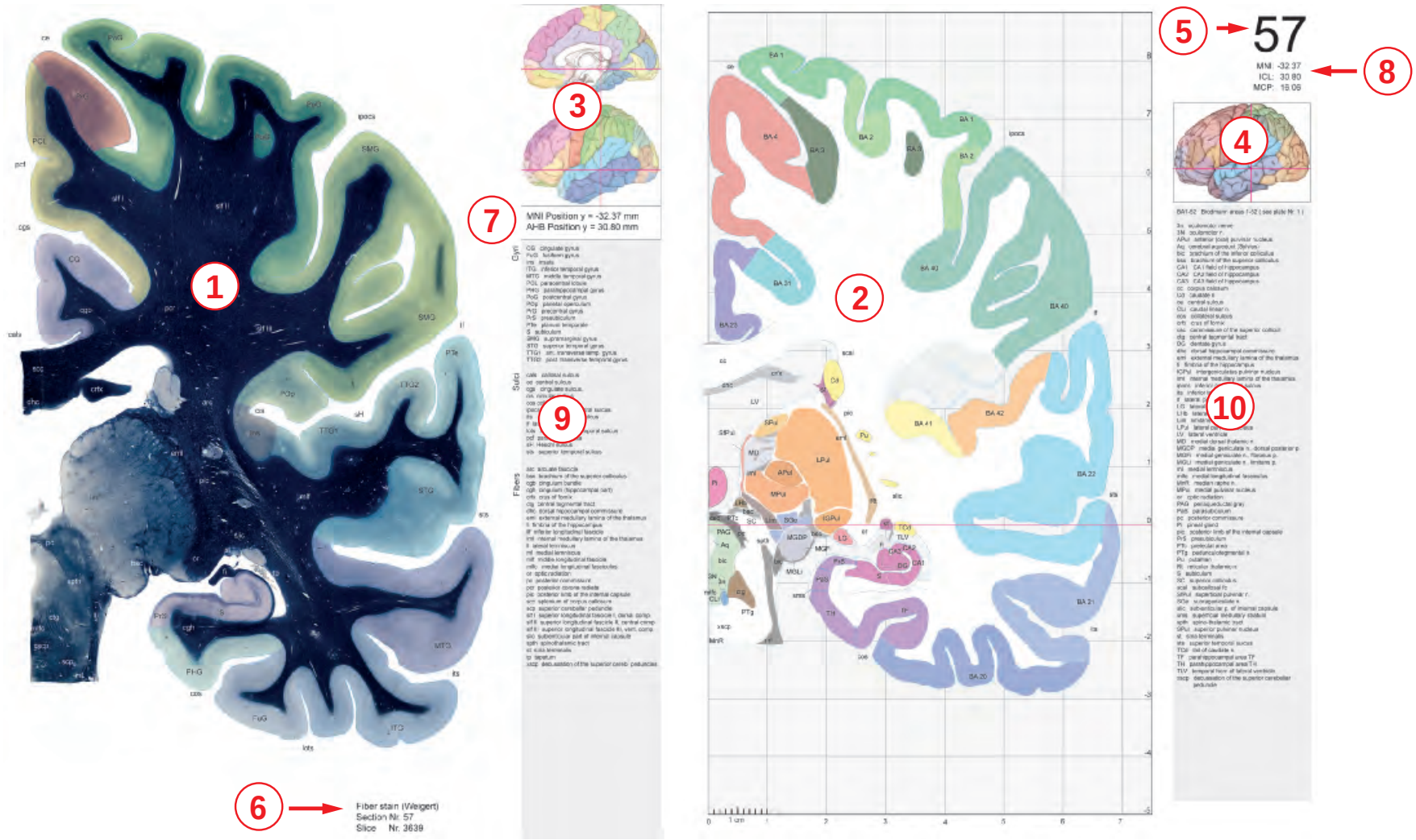


Figure 2.11. Open page view of the *Atlas* depicting the layout with the fiber-stained (myelin) sections (1) and corresponding diagrams (2) on facing pages. The colors of the cortex of the myelin section illustrate the gyral and sulcal anatomy. Since the interpretation of the cortical surface is more detailed than in the three *Atlases of the Brain in the Head* the color coding is not always exactly matching between the *Atlases*. The colors outlining the cortex on the right-sided diagram (2) illustrate the Brodmann areas. The locators (3,4), accordingly, show the anatomical cortex map (on the even numbered pages) and the Brodmann map as generated from automatic registration (on the odd numbered pages). Note that the size of the photographs and of the diagrams are not identical (see next page). The section level is indicated first, by the serial plate number (5) second, by the vertical bar in the locators, third, by the section and slice number (6) and finally, most important, by values next to the locator (7,8). The MNI-position gives the distance from the center of the anterior commisure in the MNI space; the *ICL*-position refers to the distance from the center of the anterior commissure (y=0) of the *Atlas* brain; MCP indicates the distance from the midcommissural point of the ICL of the *Atlas* brain.

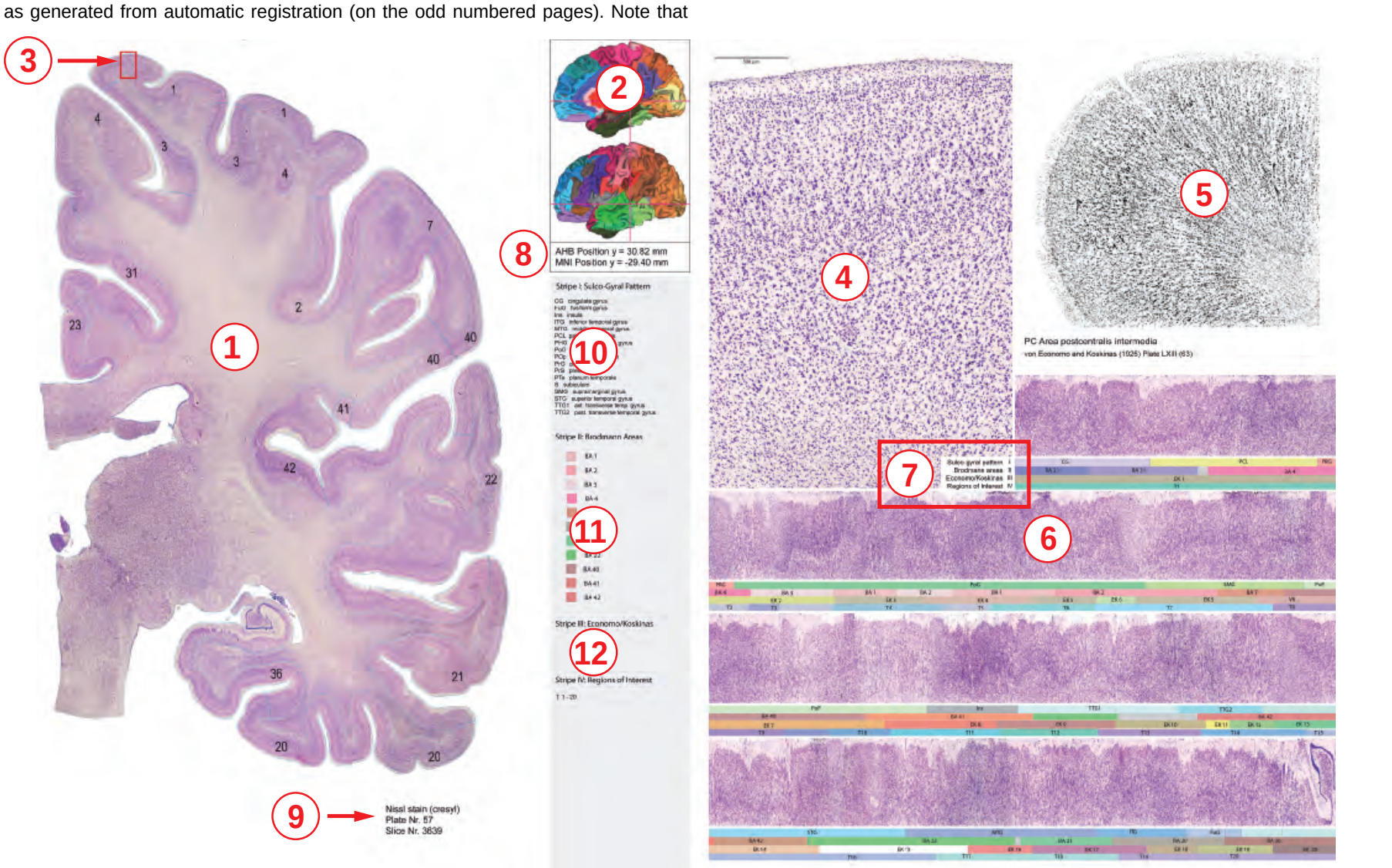


Figure 2.12. Layout of the pages presenting the photographs of the cell-stained (Nissl) sections and accompanying features. The delineated and numbered cortex areas on the cell-stained (Nissl) photographs indicate the Brodmann areas (1). The locators (2) show the midsagittal and lateral views of the brain with the Brodmann parcellations as fiducial representation (compare to Fig. 2.9). The boxed area (3) indicates the segment of cortex which is depicted at high magnification on the right side (4). The location of this segment was selected to correspond to a photograph from the von Economo and Koskinas atlas illustrating the cytoarchitecture of this region (5). In the lower half the cortical cytoarchitectonic ribbon is unfolded and presented linearly (6). The bands which are seen below the cortical cytoarchitectonic ribbon (7) provide the sequence of the sulcal-gyral organization, the Brodmann areas, the von Economo and Koskinas areas and interpretations from other authors. The location of the section is indicated by the vertical bar in the locator (2), the values indicating the distance from the center of the anterior commissure of the *AHB* and MNI coordinates (8) and the successive section number (9). The legend is subdivided (10, 11, 12) and lists the features referring to the bands below the stripes (7) separately.

Interdigitated within the existing myelin plates we have included fifty cell-stained (Nissl) plates. All photographs of the cell- and fiber-stained sections as well as the drawings have been transformed to fit the MNI-space (Section 2.1.9).

The magnification of the photographs is the same at section levels which show the corpus callosum. Anterior to the rostrum and posterior to the splenium the magnification is higher and varying, dictated by the availability of space.

Because the arrangement of the plates, diagrams and additional information may be difficult to follow, we shortly describe the layout of this part of the *Atlas* (Figs. 2.11 and 2.12).

In the *photographs of the fiber-stained (myelin) sections* we have indicated the gyral and sulcal anatomy. The colors distinguishing cortical regions indicate the surface anatomy as presented on pages 95-97.

The *photographs of the cell-stained (Nissl) sections* display the functional cortical delineations derived from Brodmann maps as generated by the semi-automatic mapping procedure from the 3D reconstruction of the *Atlas* hemisphere in the MNI-stereotaxic space (Section 2.1.13).

Within the *schematic drawings* we also provide the Brodmann areas.

Therefore, an open book side where the myeloarchitecture with the sulcal and gyral pattern is represented on the left side, the right side shows diagrams at the same section levels with the Brodmann areas together with the subcortical architecture (Fig. 2.11).

On the page opposite to the full page Nissl-plates small sectors of the cortex are displayed at high magnification. We selected areas which are thought to correspond with those published by von Economo and Koskinas (1925). The selected image from these authors is presented at low magnification (Fig. 2.12). Text and tables from von Economo and Koskinas are recently masterly translated, revised and edited by L. C. Triarhou (von Economo and Koskinas, 2008, 2009).

In the lower half of the page we depict the cortical cytoarchitectonic ribbon unfolded and presented linearly (Fig. 2.12). This presentation allows the synoptic registration of results from different sources. This arrangement makes possible to bring any x/y/z coordinate or region of interest in registry with existing entries and to correlate them with the cyto- and myeloarchitecture of the specified regions.

Since the cortical ribbon can not always be shown as a single uninterrupted band, it may be broken into several segments. Begin and direction of each stripe, however, are indicated within every Nissl-section and the topography is comprehensible by correlation with the sulco-gyral pattern (that is provided in the uppermost stripe).

Next to the locators and the serial plate number we provide the position of the photographs and diagrams of the sections by three distance measures with regard to the anterior-posterior position in the brain space: MNI, ICL and MCP, respectively.

ICL and MCP correspond to the distance along the intercommissural line of the native *Atlas* brain, not registered to the MNI-space. The ICL and MCP values indicate the position of each section either with respect to the center of the anterior commissure (ICL) or to the midcommissural point (MCP). Both values allow comparison with the previous editions of the *Atlas*.

The MNI value provides the distance from the center of anterior commissure in the MNI space (see section 2.1.10).

Due to the different anterior-posterior extension of the Atlas (171 mm) and the MNI brain (181 mm), respectively, the ICL and MNI values may differ (figure 2.13).

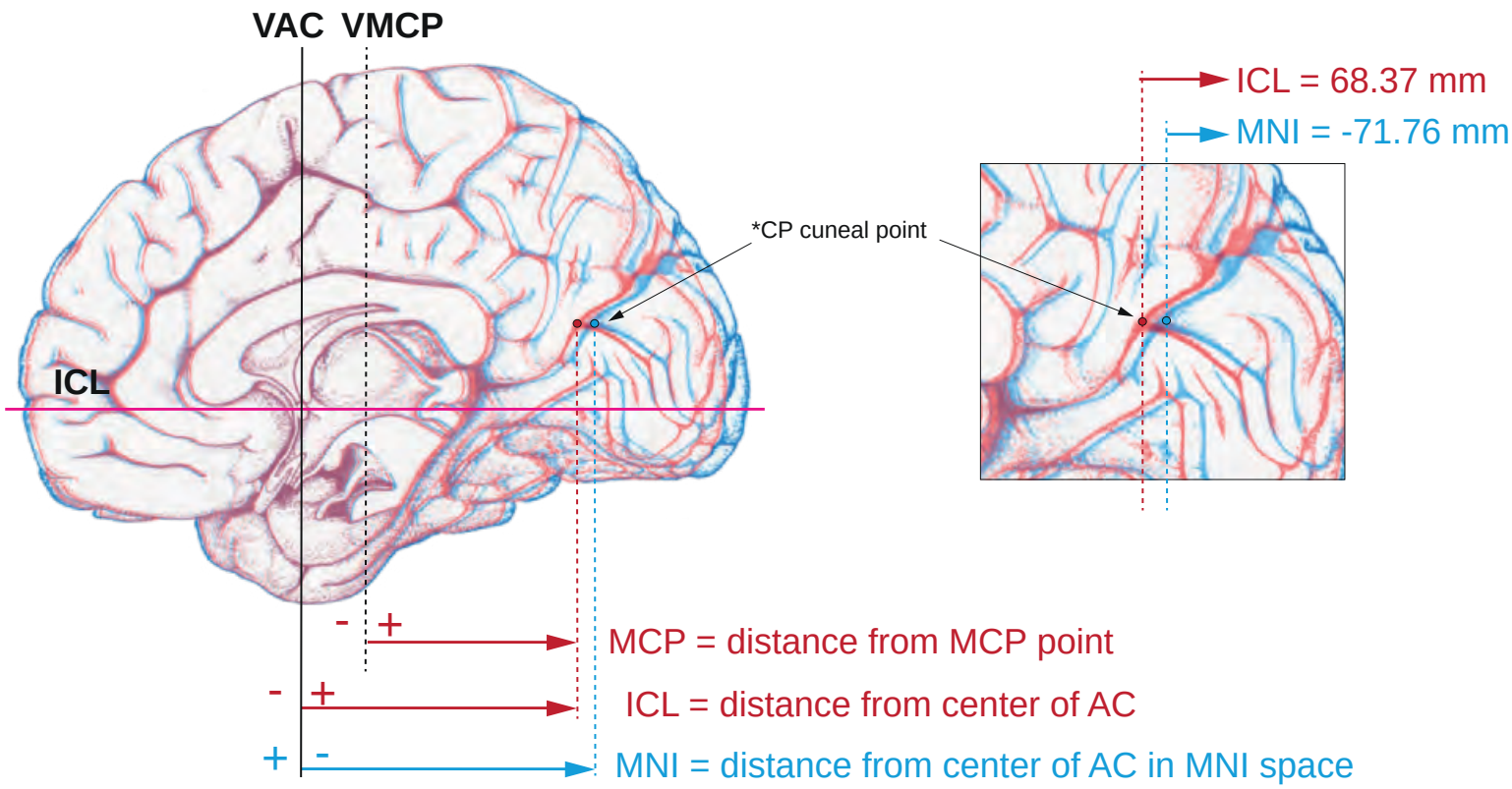


Figure 2.13. Midsagital view of the *Atlas* in the stereotaxic space of the printed *Atlas* (red) and of the Atlas brain registered to the MNI brain (blue). In both instances the point of reference [0,0,0] is located in the center of the anterior commissure (crossing of ICL and VAC). The right image shows the enlarged area around the cuneal point *CP together with the ICL and MNI distances. Abbreviations: ICL intercommissural line, MCP midcommissural point, MNI coordinate system of the Montreal Neurological Institute (MNI/ICBM2009b brain, ©1993–2004 Louis Collins, McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University), VAC vertical through the anterior commisure, VMCP vertical through the midcommissural point.

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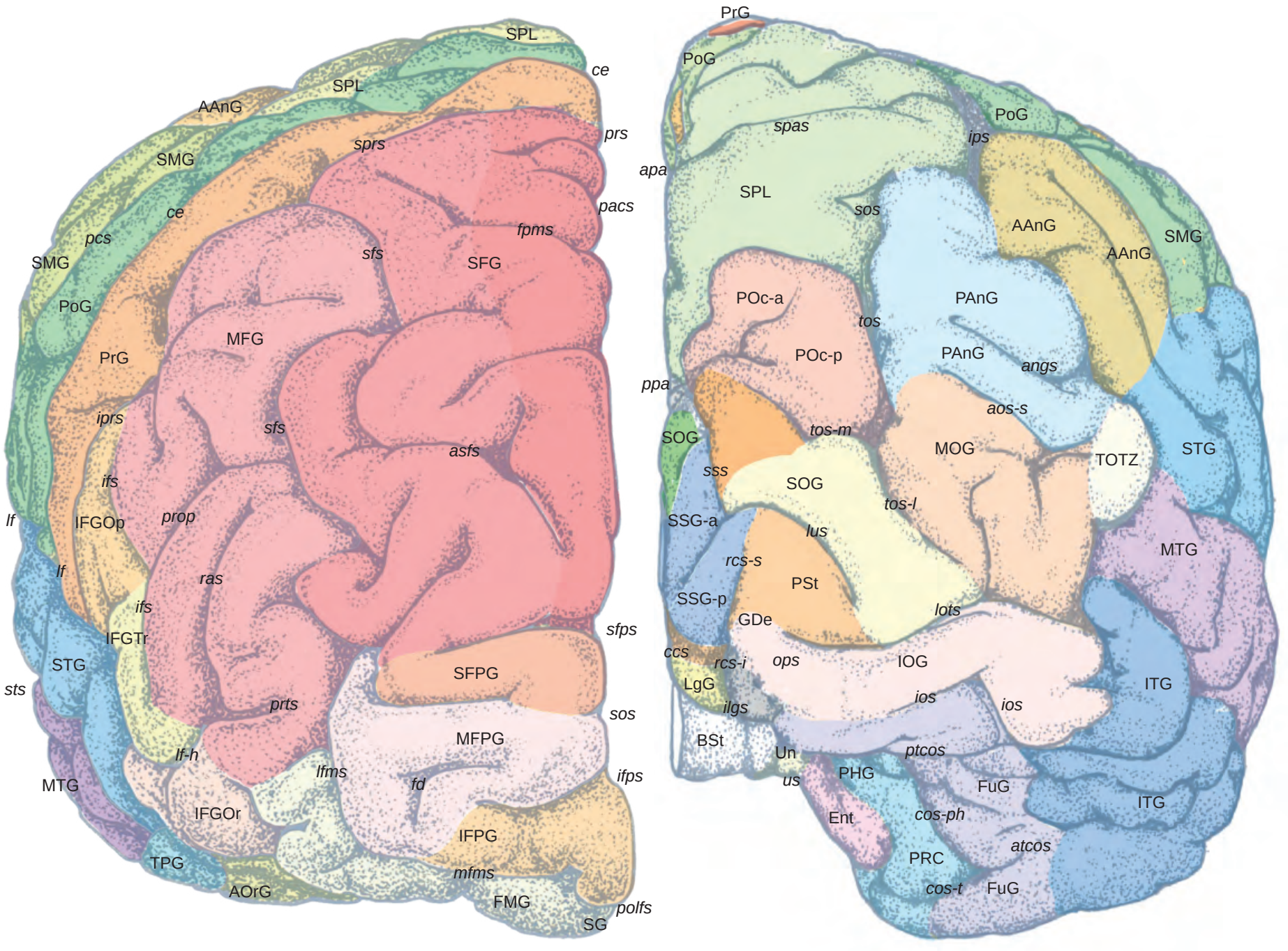
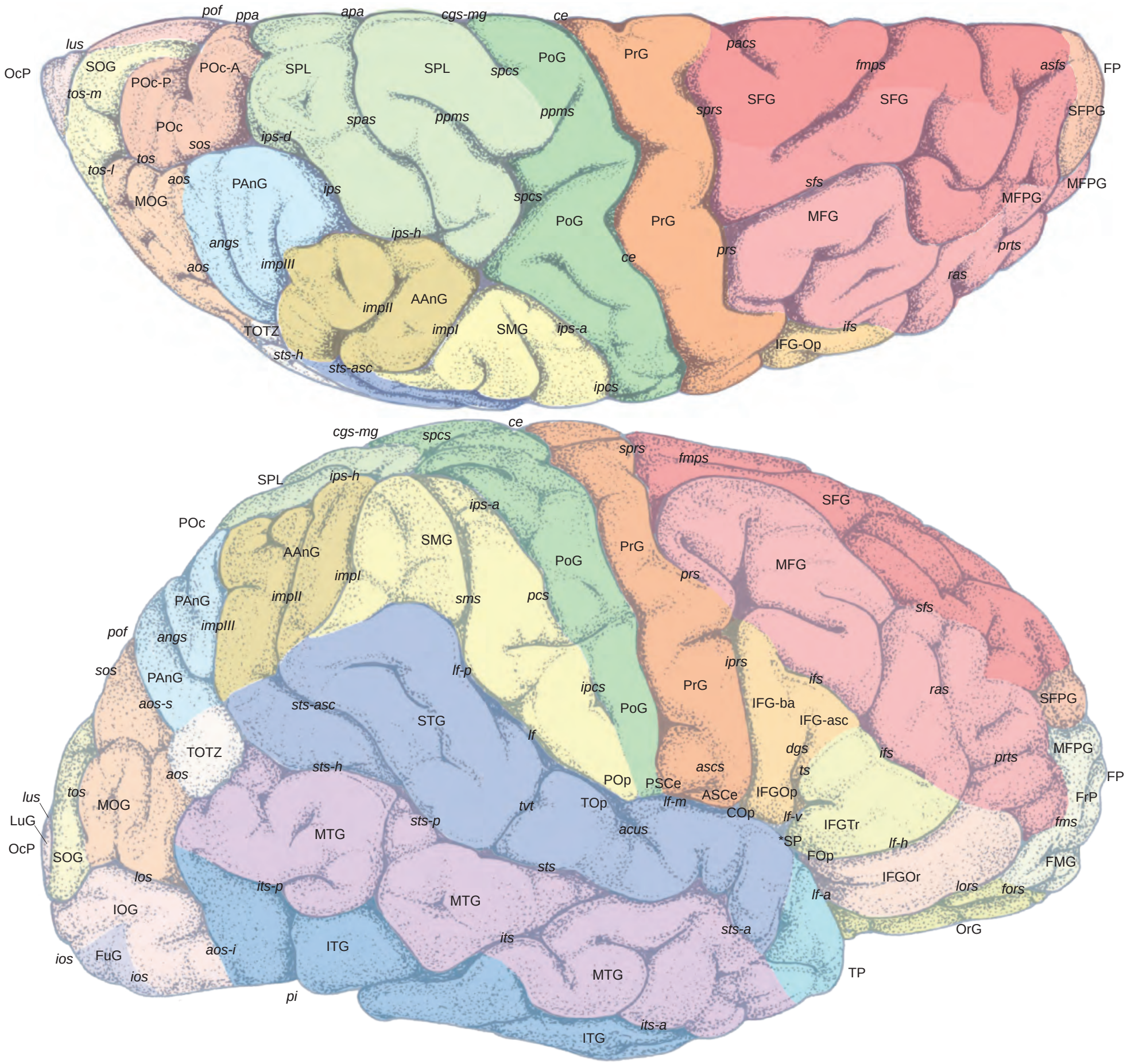
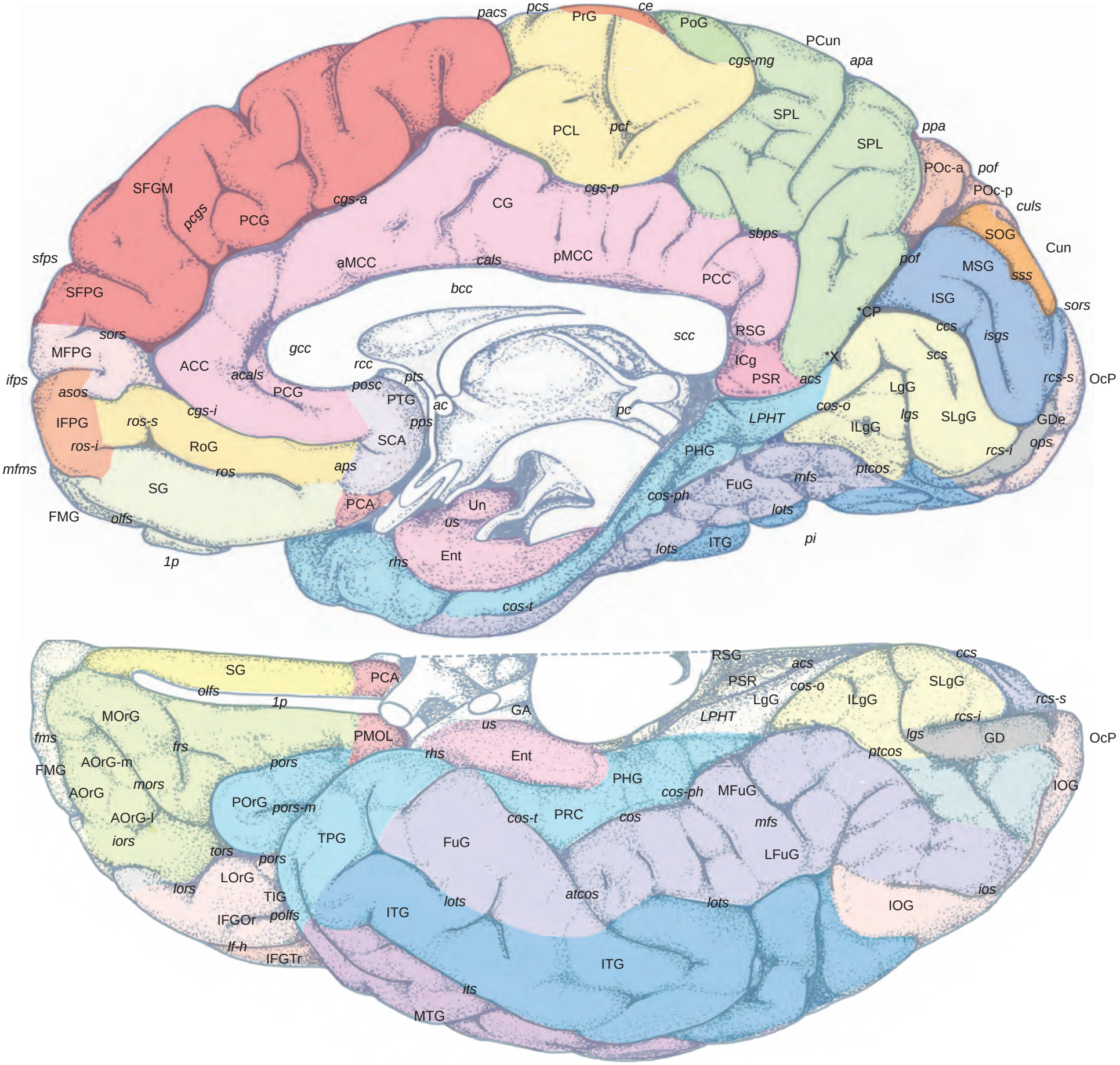
2.2 Surface Views



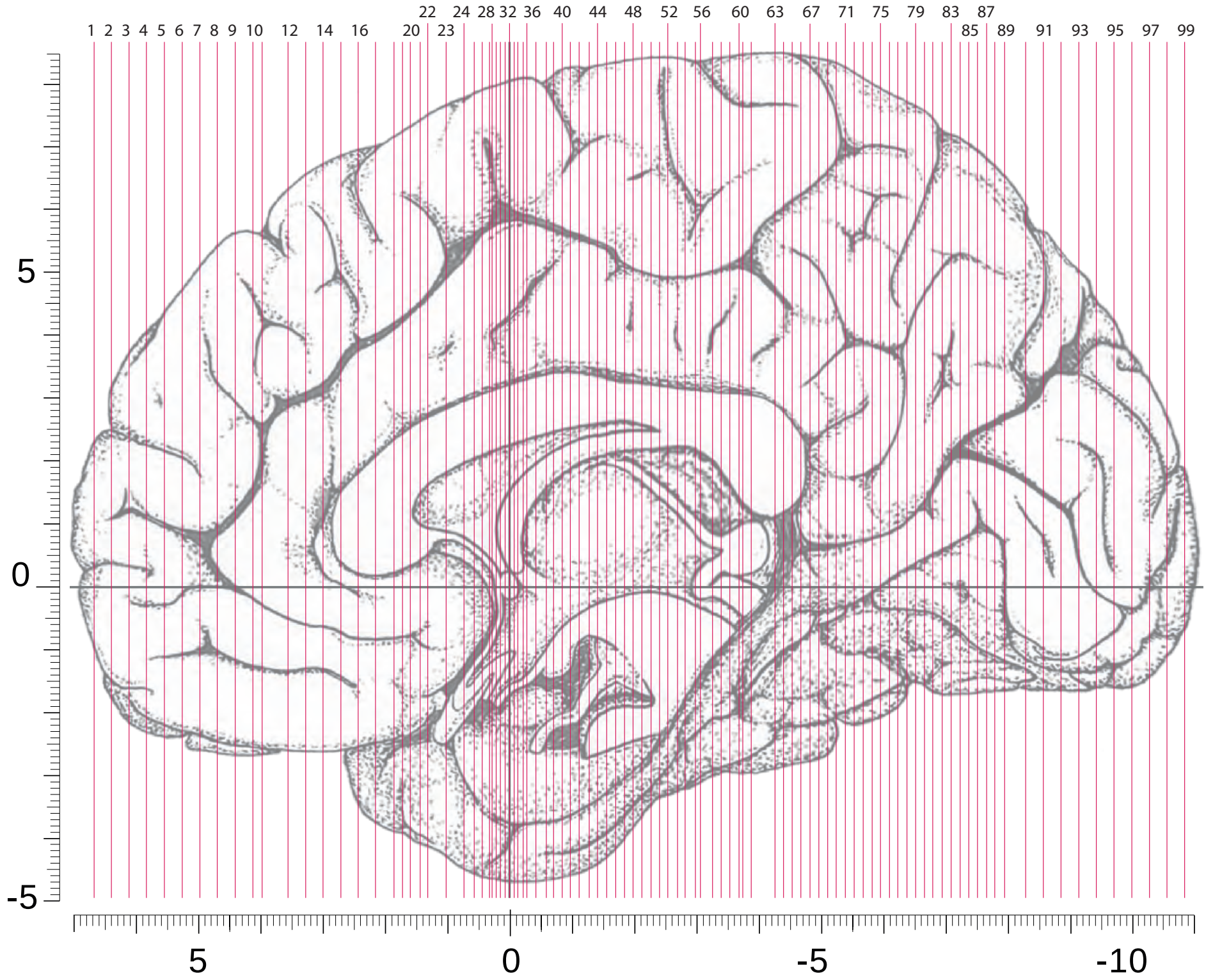
AAnG angular gyrus
AOrG anterior orbital gyrus
aos-i anterior occipital sulcus, inferior ramus
aos-s anterior occipital sulcus, superior ramus
apa posterior parietal sulcus (Vogt); (precuneal limiting sulcus)
asfs accessory superior frontal sulcus
atcos anterior transverse collateral sulcus
BSt brainstem
ccs calcarine sulcus
ce central sulcus
cos-ph collateral sulcus, parahippocampal ramus
cos-t collateral sulcus, temporal ramus
Ent entorhinal gyrus
fd frontal dimple
FMG frontomarginal gyrus
fpms frontal paramidline sulcus
FuG fusiform gyrus
IFG-Op inferior frontal gyrus, opercular part
IFG-Or inferior frontal gyrus, orbital part
IFG-Tr inferior frontal gyrus, triangular part
IFPG inferior frontopolar gyrus
ifps inferior frontopolar sulcus
ifs inferior frontal sulcus
IOG inferior occipital gyrus
ios inferior occipital sulcus
iprs inferior precentral sulcus
ips intraparietal sulcus
ISG inferior sagittal gyrus
its inferior temporal sulcus
ITG inferior temporal gyrus
lf lateral (Sylvian) fissure
lf-h lateral fissure, horizontal ramus
lfms lateral frontomarginal sulcus
LgG lingual gyrus
lots lateral occipitotemporal sulcus
lus lunate sulcus
MFG middle frontal gyrus
mfms medial frontomarginal sulcus
MFPG middle frontopolar gyrus
MOG middle occipital gyrus
MSG middle sagittal gyrus
MTG middle temporal gyrus
ops occipitopolar sulcus
pacs paracentral sulcus
pcs postcentral sulcus
PHG parahippocampal gyrus
POc-a parieto-occipital arc, anterior part
POc-p parieto-occipital arc, posterior part
PoG postcentral gyrus
polfs preolfactory transverse sulcus
ppa posterior parietal sulcus (Vogt)
PRC perirhinal cortex
PrG precentral gyrus
prop preopercular sulcus
prs precentral sulcus
prts pretriangular sulcus
PSt parastriate area
ptcos posterior transverse collateral sulcus
ras radiate sulcus
rcs-i retrocalcrine sulcus, inferior branch
rcs-s retrocalcrine sulcus, superior branch
SFG superior frontal gyrus
SFPG superior frontopolar gyrus
sfps superior frontopolar sulcus
sfs superior frontal sulcus
SG straight gyrus
SOG superior occipital gyrus
sos superior orbital sulcus
SPL superior parietal lobule
sprs superior precentral sulcus
SSG-a superior sagittal gyrus, anterior part
SSG-p superior sagittal gyrus, posterior part
sss superior saggital sulcus (v.Economo/Koskinas)
STG superior temporal gyrus
sts superior temporal sulcus
tos transverse occipital sulcus
tos-l transverse occipital sulcus, lateral ramus
tos-m transverse occipital sulcus, medial ramus
TOTZ temporooccipital transition zone
TPG temporopolar gyrus
Un uncus
us uncal sulcus



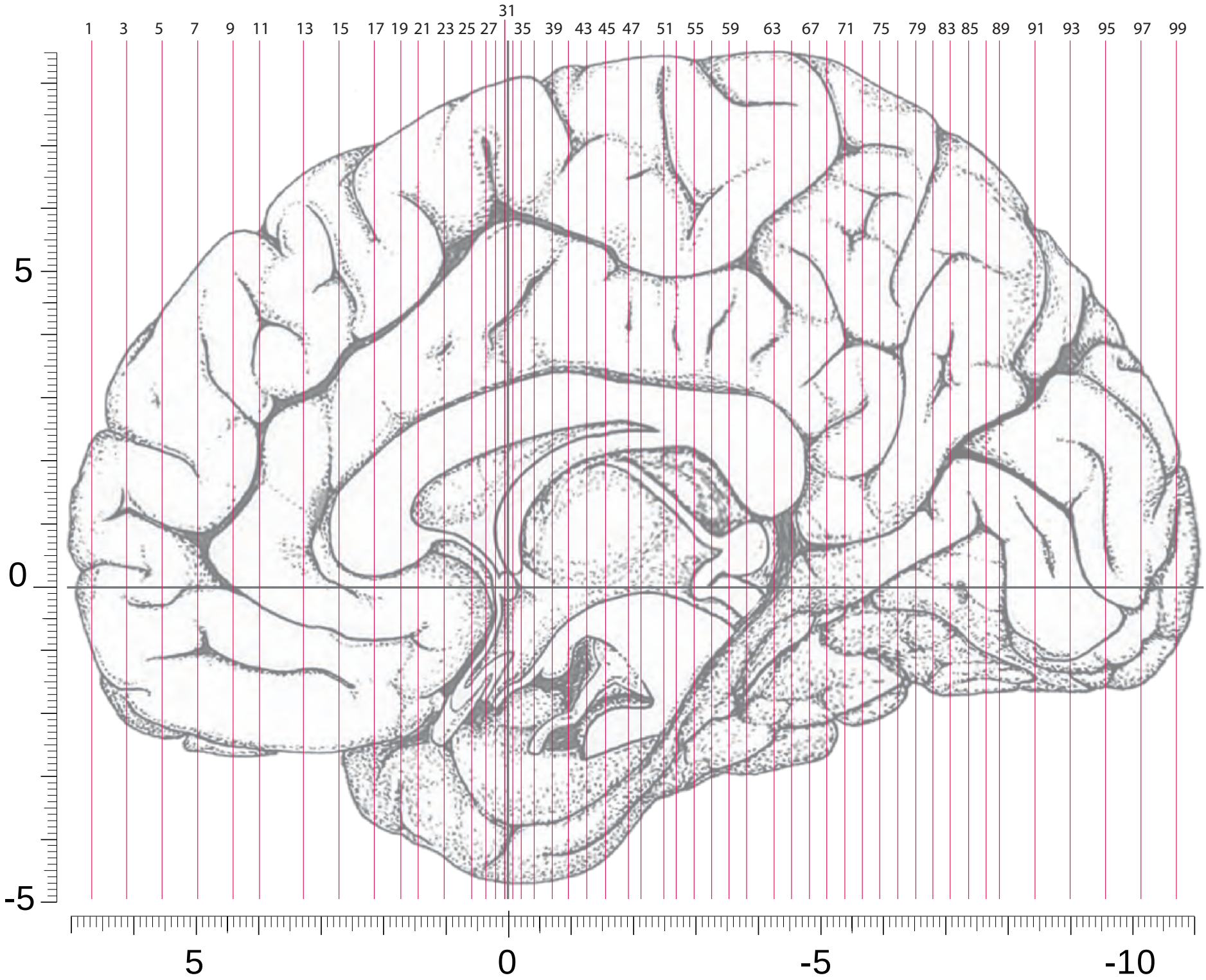
*SP Sylvian point
AAnG anterior angular gyrus
acus sulcus acusticus
angs angular sulcus
aos anterior occipital sulcus
aos-s anterior occipital sulcus, superior ramus
aos-i anterior occipital sulcus, inferior ramus
apa posterior parietal sulcus (Vogt); (precuneal limiting sulcus)
ASCe anterior subcentral gyrus
ascs anterior subcentral sulcus
asfs accessory superior frontal sulcus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
COp central operculum (Rolandi)
dgs diagonal sulcus
FMG frontomarginal gyrus
fmps frontal paramidline sulcus
fms frontomarginal sulcus
FOp frontal operculum
fors fronto-orbital sulcus
FP frontal pole
FrP frontoplolar gyrus
IFG inferior frontal gyrus
IFG-asc inferior frontal gyrus, ascending part
IFG-ba inferior frontal gyrus, basilar part
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
ifs inferior frontal sulcus
impI anterior intermediate parietal sulcus of Jensen
impII second intermediate parietal sulcus
impIII third intermediate parietal sulcus
IOG inferior occipital gyrus
ios inferior occipital sulcus
ipcs inferior postcentral sulcus
iprs inferior precentral sulcus
ips intraparietal sulcus
ips-a intraparietal sulcus, ascending segment
ips-d intraparietal sulcus, descending segment
ips-h intraparietal sulcus, horizontal segment
ITG inferior temporal gyrus
its inferior temporal sulcus
its-a inferior temporal sulcus, anterior segment
its-p inferior temporal sulcus, posterior segment
lf lateral fissure
lf-a lateral fissure, anterior segment
lf-h lateral fissure, horizontal segment
lf-m lateral fissure, middle segment
lf-p lateral fissure, posterior segment
lf-v lateral fissure, vertical segment
lors lateral orbital sulcus
los lateral occipital sulcus
LuG lunate gyrus
lus lunate sulcus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOG middle occipital gyrus
MTG middle temporal gyrus
OcP occipital pole
OrG orbital gyri
pacs paracentral sulcus
PAnG posterior angular gyrus
pcs postcentral sulcus
pi preoccipital notch
POc parieto-occipital arc (first parieto-occipital « plis de passage » of Gratiolet)
POc-a parieto-occipital arc, anterior part
POc-p parieto-occipital arc, posterior part
PoG postcentral gyrus
POp parietal operculum
pof parieto-occipital fissure
ppms posterior paramidline sulcus
ppa posterior parietal sulcus (Vogt)
PrG precentral gyrus
prs precentral sulcus
prts pretriangular sulcus
PSCe posterior subcentral gyrus
ras radiate sulcus (Eberstaller)
SFG superior frontal gyrus
SFPG superior frontopolar gyrus
sfs superior frontal sulcus
SMG supramarginal gyrus
sms supramarginal sulcus
SOG superior occipital gyrus
sos superior occipital sulcus
spas superior parietal sulcus
spcs superior postcentral sulcus
SPL superior parietal lobule
sprs superior precentral sulcus
STG superior temporal gyrus
sts superior temporal sulcus
sts-a superior temporal sulcus, anterior segment
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment
sts-p superior temporal sulcus, posterior segment
TOp temporal operculum
tos transverse occipital sulcus
tos-l transverse occipital sulcus, lateral ramus
tos-m transverse occipital sulcus, medial ramus
TOTZ temporooccipital transition zone
TP temporal pole
ts triangular sulcus
tvt transverse temporal sulcus



*CP cuneal point
*X cuneolingual gyrus (in depth) (-> Ribas)
1p olfactory peduncle
ac anterior commissure
acals accessory callosal sulcus
ACC anterior cingulate cortex
acs calcarine sulcus, anterior part
aMCC anterior midcingulate cortex (B.Vogt)
AOrG anterior (intermediate) orbital gyrus
AOrG-l anterior (intermediate) orbital g., lateral part
AOrG-m anterior (intermediate) orbital g., medial part
apa posterior parietal sulcus (Vogt); (precuneal limiting sulcus)
aps anterior parolfactory sulcus
asos accessory supraorbital sulcus
atcos anterior transverse collateral sulcus
bcc body of corpus callosum
cals callosal sulcus
ccs calcarine sulcus, central part
ce central sulcus
CG cingulate gyrus
cgs-a cingulate sulcus, anterior part
cgs-i inferior cingulate sulcus
cgs-mg marginal ramus of cingulate sulcus
cgs-p cingulate sulcus, posterior part
cos collateral sulcus (medial occipitotemporal s.)
cos-o collateral sulcus, occipital ramus
cos-ph collateral sulcus, parahippocampal ramus
cos-t collateral sulcus, temporal ramus
culs cuneal limiting sulcus
Cun cuneus
Ent entorhinal gyrus
FMG frontomarginal gyrus
fms frontomarginal sulcus
frs fragmentosus sulcus
FuG fusiform gyrus
GA ambiens gyrus
gcc genu of corpus callosum
GDe gyrus descendens (Ecker)
ICg isthmus of cungulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IFPG inferior frontopolar gyrus
ifps inferior frontopolar sulcus
ILgG inferior lingual gyrus
IOG inferior occipital gyrus
iors intermediate orbital sulcus
ios inferior occipital sulcus
ISG inferior sagittal gyrus
isgs inferior sagittal sulcus (S. limitans superior)
ITG inferior temporal gyrus
its inferior temporal sulcus
lf-h lateral fissure, horizontal
LFuG lateral fusiform gyrus
LgG lingual gyrus
lgs lingual sulcus
LOrG lateral orbital gyrus
lors lateral orbital sulcus
lots lateral occipitotemporal sulcus
LPHT lingual-parahippocampal transition area
mfms medial frontomarginal sulcus
MFPG middle frontopolar gyrus
mfs midfusiform sulcus
MFuG medial fusiform gyrus
MOrG medial orbital gyrus
mors middle orbital sulcus
MSG middle sagittal gyrus
MTG medial temporal gyrus
OcP occipital pole
olfs olfactory sulcus
ops occipitopolar sulcus (extreme fissure of Seitz)
pacs paracentral sulcus
pc posterior commissure
PCA precommissural archicortex
PCC posterior cingulate cortex (B.Vogt)
pcf paracentral fossa
PCg paracingulate gyrus
pcgs paracingulate sulcus
PCL paracentral lobule
pcs precentral sulcus
PCun precuneus
PHG parahippocampal gyrus
pi preoccipital incisure
pMCC posterior midcingulate cortex (B.Vogt)
PMOL posteromedial orbital lobule
POc-a occipitoparietal arch, anterior part
POc-p occipitoparietal arch, posterior part
pof parieto-occipital fissure
PoG postcentral gyrus
polfs preolfactory transverse sulcus
POrG posterior orbital gyrus
pors posterior orbital sulcus
pors-m posterior orbital sulcus, middle branch
posc postreme subcallosal sulcus
ppa posterior parietal sulcus (Vogt)
pps posterior parolfactory sulcus
PRC perirhinal cortex
PrG precentral gyrus
PSR perisplenial region
ptcos posterior transverse collateral sulcus
PTG paraterminal gyrus
pts paraterminal sulcus
rcc rostrum of corpus callosum
rcs-i retrocalcarine sulcus, lower branch
rcs-s retrocalcarine sulcus, upper branch
rhs rhinal sulcus
RoG rostral gyrus
ros rostral sulcus
ros-i rostral sulcus, inferior (lower) branch
ros-s rostral sulcus, superior (upper) branch
RSG gyri limbici retrospleniales (vonEconomo)
sbps subparietal sulcus
SCA subcallosal area
scc splenium of corpus callosum
scs subcalcarine sulcus
SFGM superior frontal gyrus, medial division
SFPG superior frontopolar gyrus
sfps superior frontopolar sulcus
SG straight gyrus
SLgG superior lingual gyrus
SOG superior occiptal gyrus
sors supraorbital sulcus
sos superior occipital sulcus
SPL superior parietal lobule
SSG superior sagittal gyrus
sss superior sagittal sulcus (v.Economo/Koskinas)
TIG transverse insular gyrus
tors transverse orbital sulcus
TPG temporopolar gyrus
Un uncus
us uncal sulcus



Location of the following 99 fiber-stained (myelin) sections and accompanying high detail diagrams. The diagram on this side shows the dimensions of the MNI-transformed unsectioned brain. “0” marks the vertical through the center of the anterior commissure. A negative sign signifies sections posteriorly to the center of anterior commissure (AC). Rostral and caudal to the corpus callosum we used higher and varying magnification, dictated by the availability of space. Between the two anterior-posterior extremes of the corpus callosum we kept the magnificaiton constant.



Location of the 50 cell-stained (Nissl) sections. The diagram shows the dimensions of the MNI-transformed unsectioned brain.

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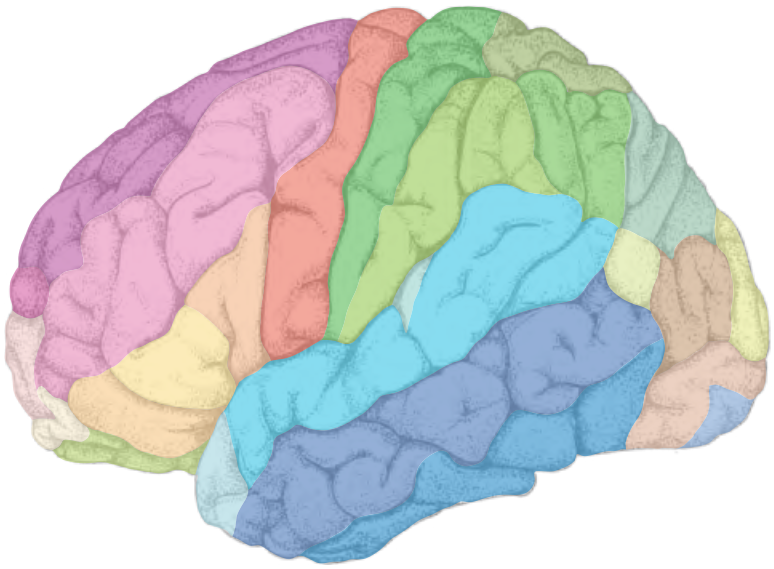
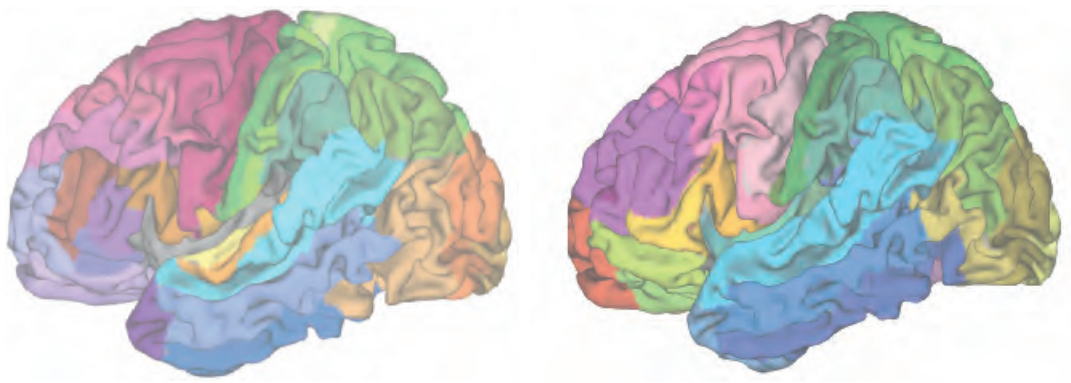
2.3 Plates, Figures and Diagrams



Sulci and Gyri



Brodmann (1909) von Economo and Koskinas (1925)

The figures demonstrating the cortical delineations by Brodmann and von Economo and Koskinas are based on the surface registration of their published diagrams to the *3D-AHB* as described in sections 2.1.13 and not on dedicated cytoarchitectonic analysis.

Brodmann Areas

- BA1 area postcentralis intermedia
- BA2 area postcentralis caudalis
- BA3 area postcentralis oralis
- BA4 area gigantopyramidalis
- BA5 area praeparietalis
- BA6 area frontalis agranularis
- BA7 area parietalis superior
- BA8 area frontalis intermedia
- BA9 area frontalis granularis
- BA10 area frontopolaris
- BA11 area praefrontalis
- BA12 area praefrontalis
- BA13-16 fields 13-16 correspond to the insular cortex
- BA17 area striata
- BA18 area occipitalis
- BA19 area praeoccipitalis
- BA20 area temporalis inferior
- BA21 area temporalis media
- BA22 area temporalis superior
- BA23 area cingularis posterior ventralis
- BA24 area cingularis anterior ventralis
- BA25 area subgenualis
- BA26 area ectosplenialis
- BA27 area praesubicularis
- BA28 area entorhinalis
- BA29 area retrolimbica granularis
- BA30 area retrolimbica agranularis
- BA31 area cingularis posterior dorsalis
- BA32 area cingularis anterior dorsalis
- BA33 area praegenualis
- BA34 area entorhinalis dorsalis
- BA35 area perirhinalis
- BA36 area ectorhinalis
- BA37 area occipito-temporalis
- BA38 area temporopolaris
- BA39 area angularis
- BA40 area supramarginalis
- BA41 area temporalis transversa interna (anterior)
- BA42 area temporalis transversa externa (posterior)
- BA43 area subcentralis
- BA44 area opercularis
- BA45 area triangularis
- BA46 area frontalis media
- BA47 area orbitalis
- BA48 area retrosubicularis
- BA49 area parasubicularis
- BA51 area prepiriformis
- BA52 area parainsularis

Öngür et.al. (2003)

OP Architectonic areas of the orbital and medial prefrontal cortex adopted from Öngür et al., (2003).
OP {10, 11, 47/12, 13,14,24,25,32,47}

- OP_AON anterior olfactory nucleus
- OP_G gustatory cortex
- OP_I agranular insular cortex
- OP_PRCO precentral opercular area

BA*

BA* indicates a mismatch between the delineations of Brodmann and those registered from the publication from Öngur et al., (2003). It signifies the extension of the Brodmann area as compared to the territory defined by Öngür et al., (2003).

The 54 Principal Areas of von Economo and Koskinas (1925)

Lobus frontalis F
- FA Area praecentralis
- FB Area frontalis agranularis
- FC Area frontalis intermedia
- FD Area frontalis granularis
- FE Area frontopolaris

Regio orbitalis
- FF Area orbitalis (granularis)
- FG Area gyri recta (Area recta)
- FH Area praefrontalis
- FI Area frontoinsularis
- FK Area piriformis frontalis
- FL Area parolfactoria
- FM Area geniculata
- FN Area praecommissuralis

Lobus limbicus L
- LA Area limbica ant. agr.
- LB1 Area ultracingularis ant.
- LB2 Area indusei
- LC1 Area cingularis post. dorsalis
- LC2 Area cingularis post. ventral.
- LC3 Area cingularis limit. post.
- LD Area retrosplenialis agranul.
- LE Area retrosplenialis granulosa
- LF1 Area ultracingularis post.
- LF2 Area (ultracingularis) obtecta

Lobus insulae I
- IA Area insulae praecentralis
- IB Area insulae postcentralis
- IC Area orbito-insularis
- ID Area insularis piriformis

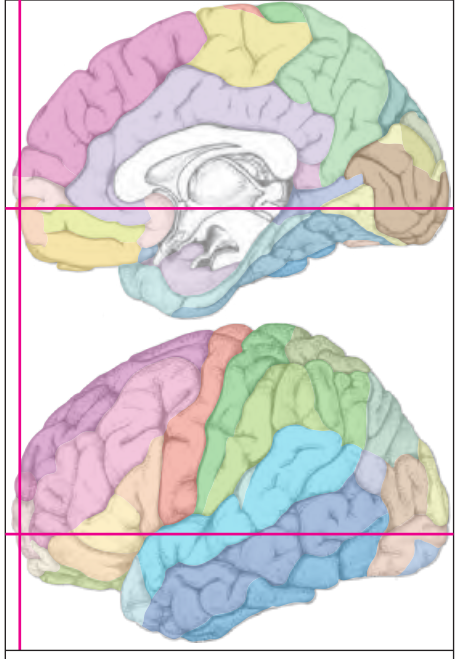
Lobus parietalis P
- PA1 Area postcentralis gigantopyramidalis
- PB2 Area postcentralis oralis simplex
- PC Area postcentralis intermedia
- PD Area postcentralis caudalis
- PE Area parietalis superior
- PF Area supramarginalis
- PG Area angularis
- PH Area parietalis (temporo-occipitalis) basalis

Lobus occipitalis O
- OA Area peristriata
- OB Area parastriata
- OC Area striata (granulosa)

Lobus temporalis T
- TA Area temporalis sup.
- TB Area supratemporalis magnocellularis simplex
- TC Area supratemporalis granulosa
- TD Area supratemporalis intercalata
- TE Area temporalalis propria
- TF Area fusiformis
- TH Area hippocampotemporalis
- TG Area temporopolaris
- TI Area piriformis temporalis
- TK Area substantiae perforatae post.

Lobus limbicus inferior H
- HA Area uncinata
- HB Area parauncinata
- HC Area rhinalis limitans
- HD Area praesubicularis granulosa
- HE Area pyramidalis
- HF Area fasciae dentatae

Cortex: Gyri and Sulci



MNI Position y = 66.21 mm
AHB Position y = -63.03 mm

SFPG
mfps
sos
MFPG
fp
MFPG
fd
ifps
IFPG
IFPG
mfms
FMG

Gyri

FMG frontomarginal gyrus
IFPG inferior frontopolar gyrus
MFPG middle frontopolar gyrus
SFPG superior frontopolar gyrus

Sulci

fd frontopolar dimple
ifps inferior frontopolar sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
sos supraorbital sulcus

Fibers

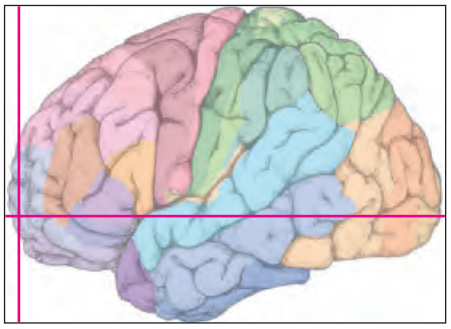
fp frontopolar fibers

Fiber stain (Weigert)
Section Nr. 1
Slice Nr. 138

Cortex: Brodmann Areas

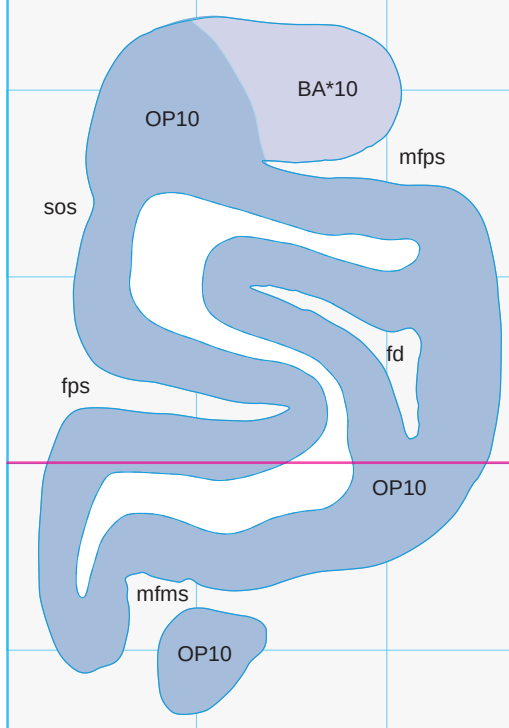
1

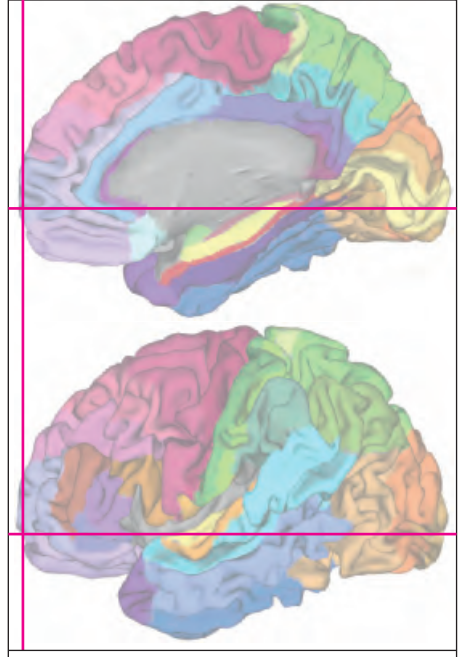
MNI: 66.21
ICL: -63.03
MCP: -77.77



BA1-52 Brodmann areas 1-52 (see p. 101)
BA*10 see p. 101
OP 10 area defined by Öngür et.al. (2003)

fd frontal dimple
fps frontopolar sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
sos superior occipital sulcus





MNI Position y = 66.16 mm
AHB Position y = -62.98 mm

Gyral Pattern

FMG frontomarginal gyrus
IFPG inferior frontopolar gyrus
MFPG middle frontopolar gyrus
SFPG superior frontopolar gyrus

Brodmann Areas

BA10 area frontopolaris
OP10 area 10 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

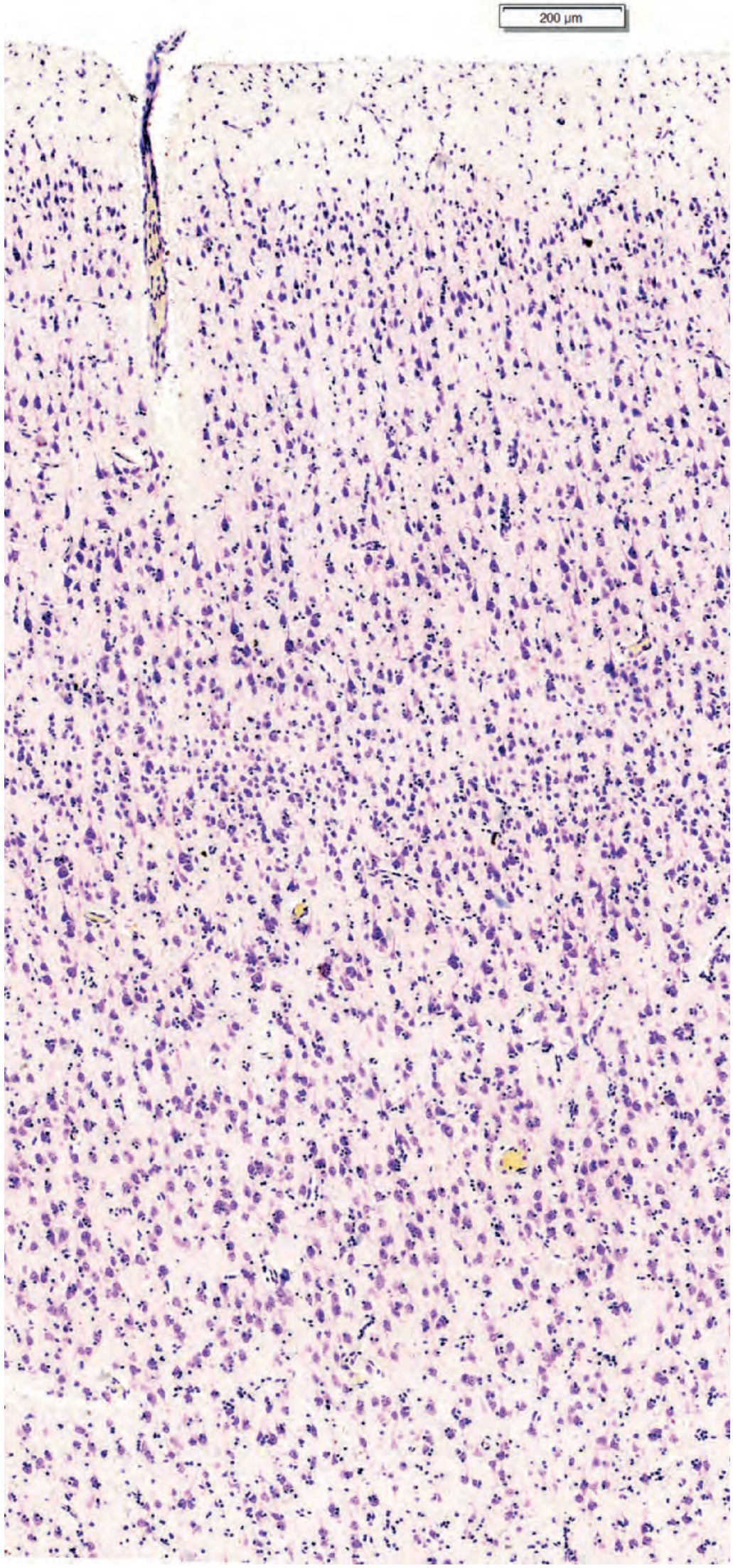
von Economo and Koskinas

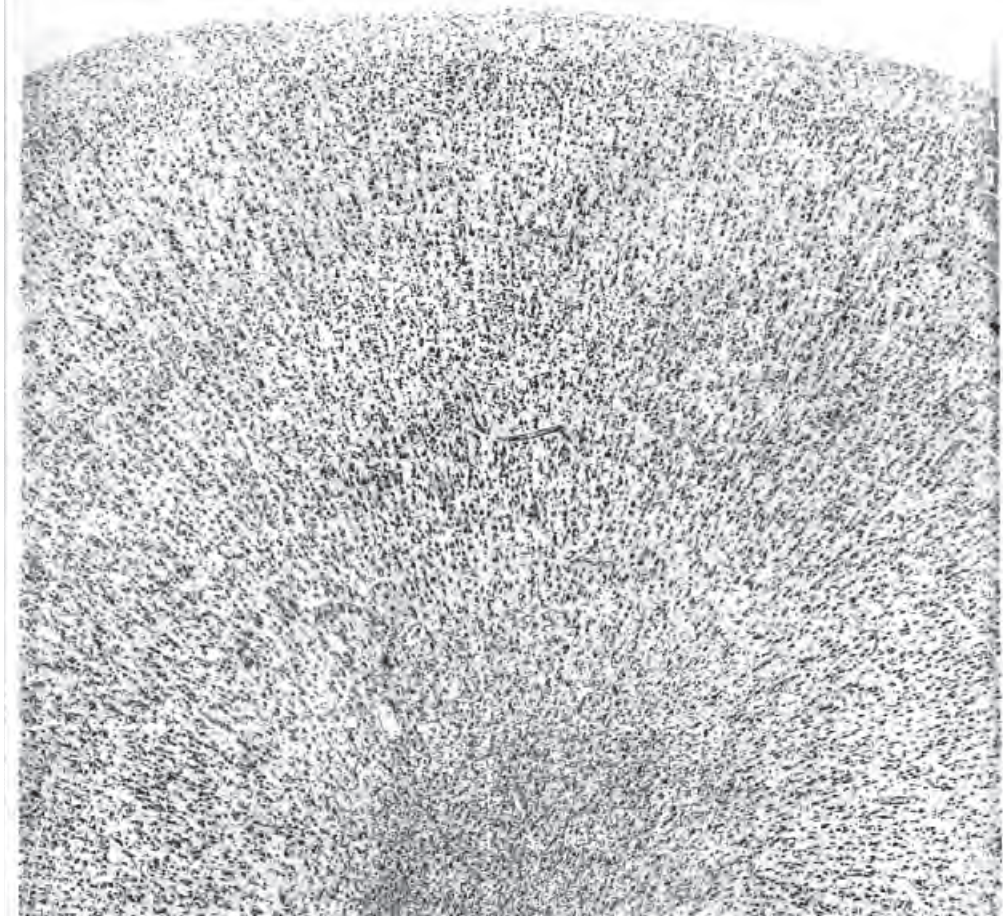
FD granular frontal area
FE frontopolar area

Regions of Interest

-

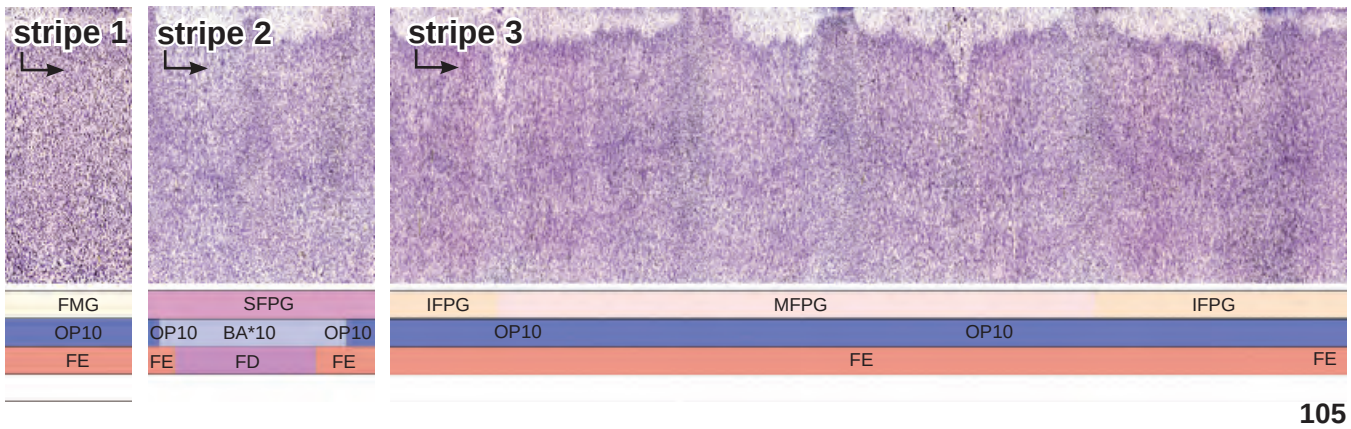
Cell stain (Nissl):
Section Nr. 1
Slice Nr. 140



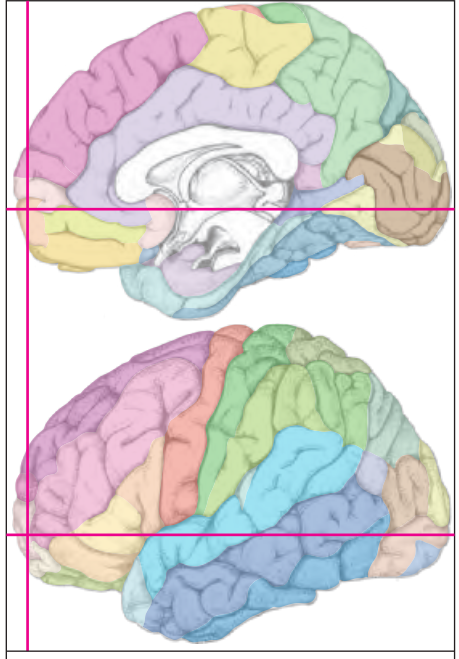


FE Area frontopolaris

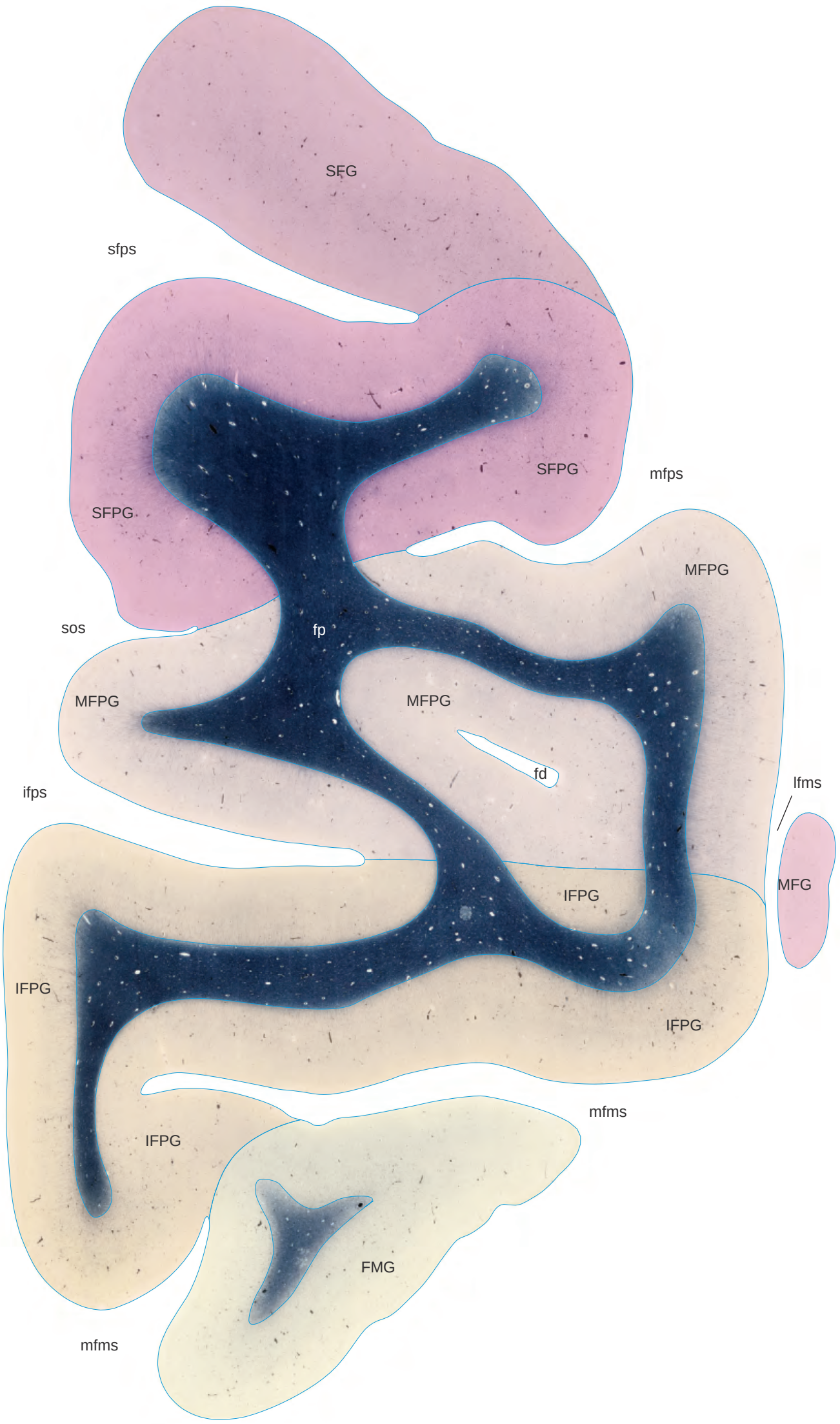
von Economo and Koskinas (1925) Plate XXXI (31)



Cortex: Gyri and Sulci



MNI Position y = 63.45 mm
AHB Position y = -60.41 mm



Gyri

FMG frontomarginal gyrus
IFPG inferior frontopolar gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
SFG superior frontal gyrus
SFPG superior frontopolar gyrus

Sulci

fd frontopolar dimple
ifps inferior frontopolar sulcus
lfms lateral frontomarginal sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
sfps superior frontopolar sulcus
sos supraorbital sulcus

Fibers

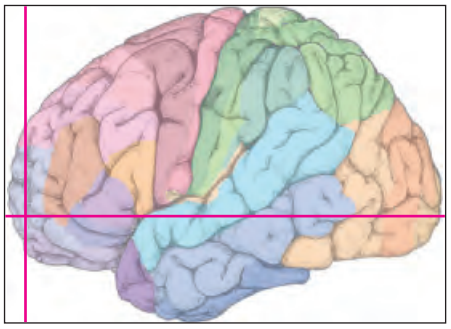
fp frontopolar fibers

Fiber stain (Weigert)
Section Nr. 2
Slice Nr. 236

Cortex: Brodmann Areas

2

MNI: 63.45
ICL: -60.41
MCP: -75.15



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10 see p. 101

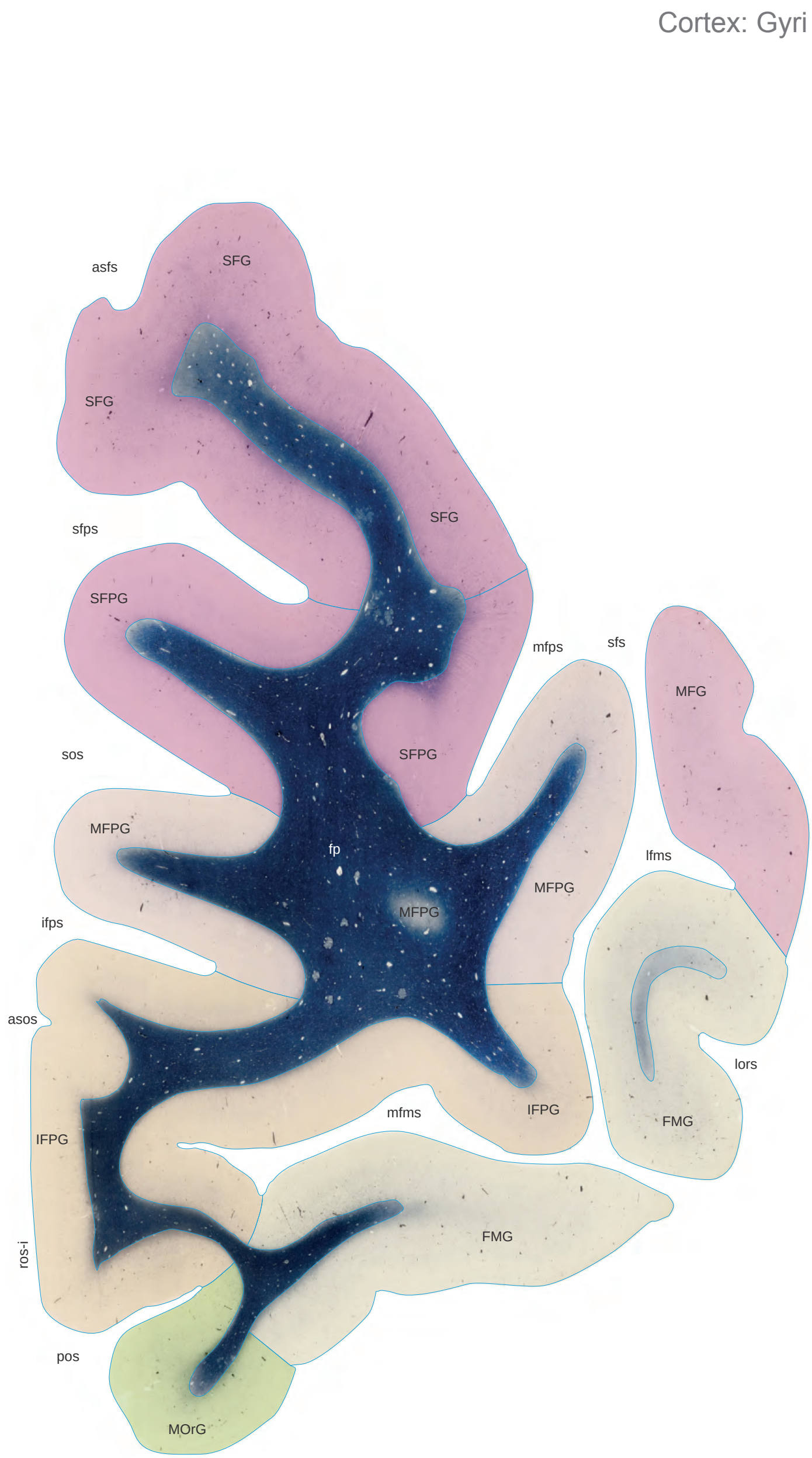
ifps inferior frontopolar sulcus
lfms lateral frontomarginal sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
OP10, 11 areas defined by Öngür et.al. (2003)
sfps superior frontopolar sulcus
sos superior occipital sulcus

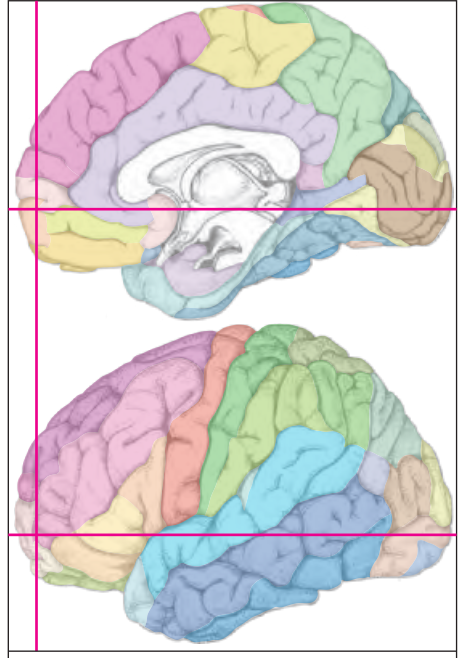
BA9
sfps
BA*10
mfps
sos
OP10
ifps
OP10
lfms
OP10
OP10
OP11
mfms

8 7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5

0 1 cm 1 2 3 4 5 6 7

Cortex: Gyri and Sulci





MNI Position y = 60.64 mm
AHB Position y = -57.73 mm

Gyri

FMG frontomarginal gyrus
IFPG inferior frontopolar gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
SFG superior frontal gyrus
SFPG superior frontopolar gyrus

Sulci

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifps inferior frontopolar sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
pos praeolfactory sulcus
ros-i rostral sulcus, inferior part
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos supraorbital sulcus

Fibers

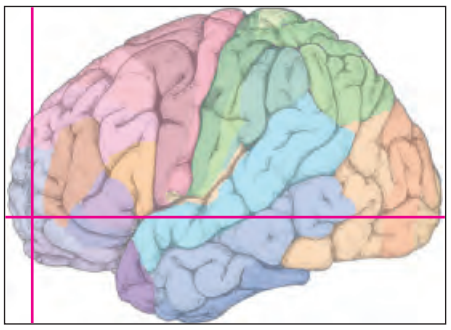
fp frontopolar fibers

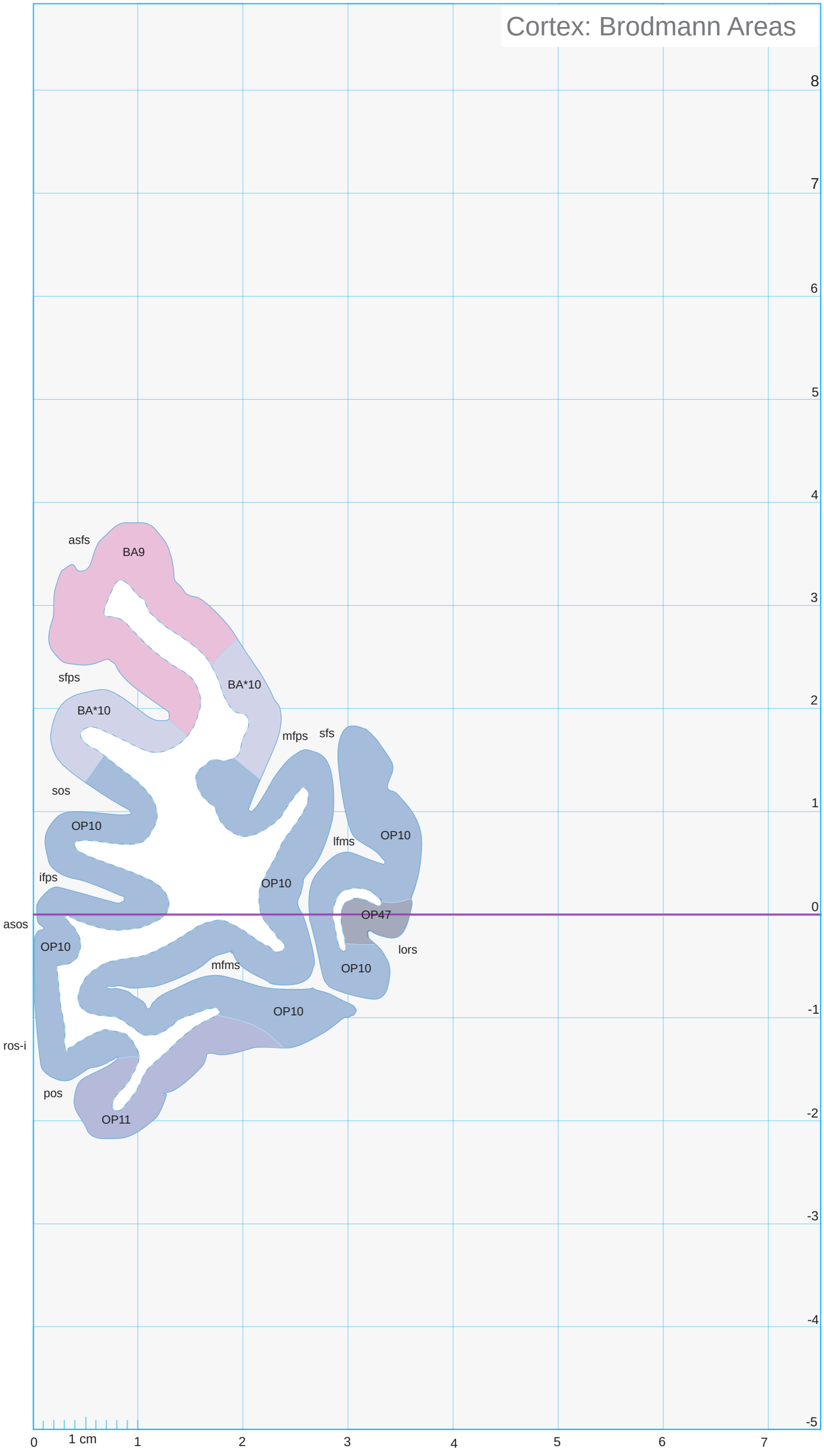
Fiber stain (Weigert)
Section Nr. 3
Slice Nr. 336

Cortex: Brodmann Areas

3

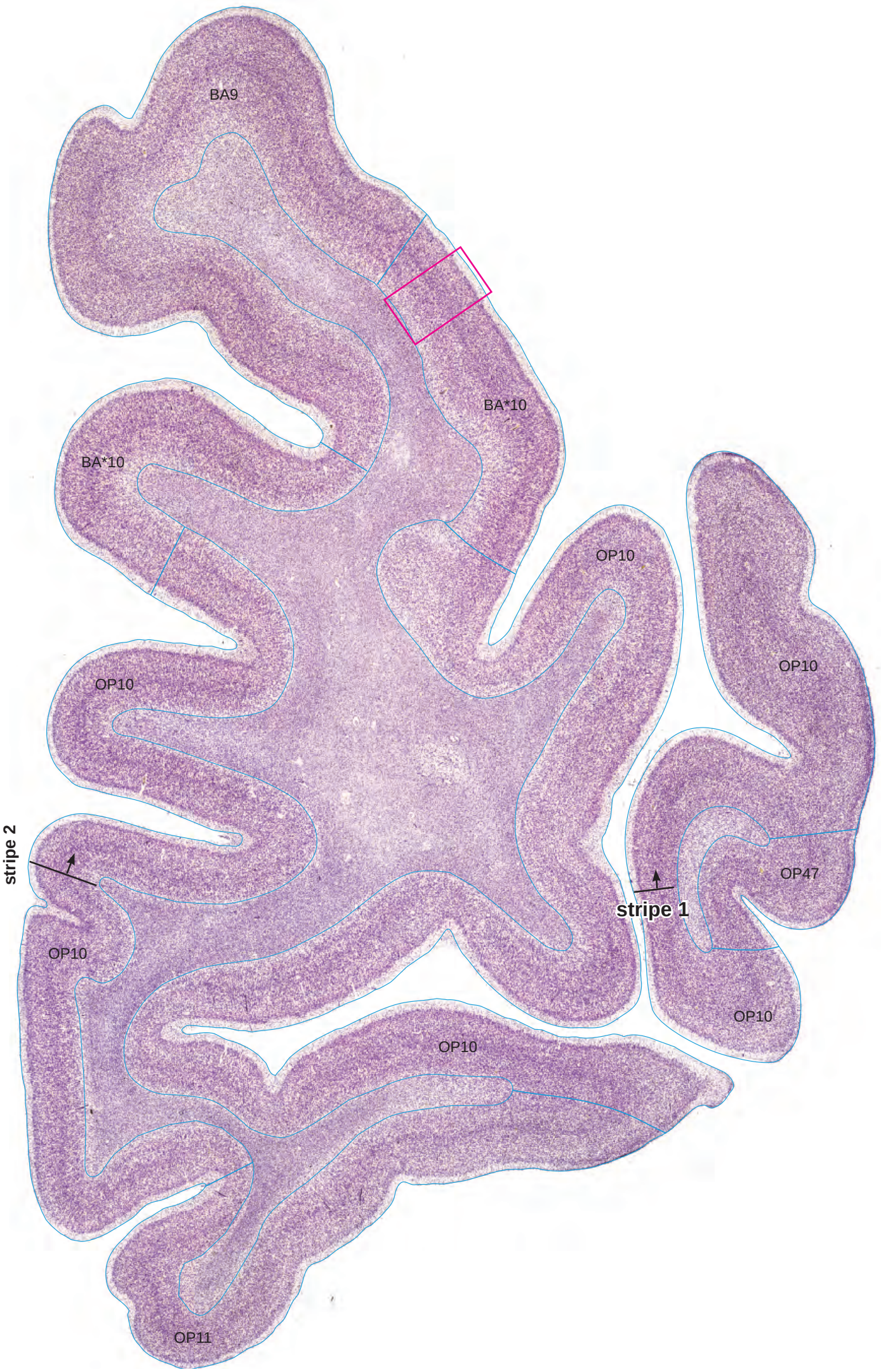
MNI: 60.64
ICL: -57.73
MCP: -72.47

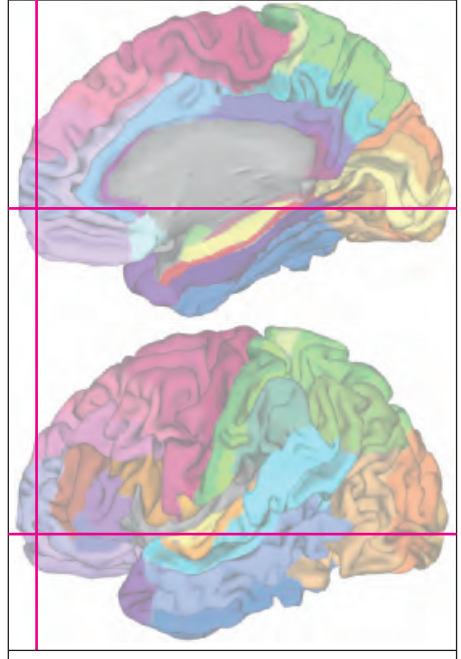




BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10 see p. 101

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifps inferior frontopolar sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
OP10,11,47 areas defined by Öngür et.al. (2003)
pos praeolfactory sulcus
ros-i rostral sulcus, inferior (lower) branch
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos superior occipital sulcus





MNI Position y = 60.61 mm
AHB Position y = -57.70 mm

Gyral Pattern

FMG frontomarginal gyrus
IFPG inferior frontopolar gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
SFG superior frontal gyrus
SFPG superior frontopolar gyrus

Brodmann Areas

BA9 area frontalis granularis
BA10 area frontopolaris
OP10 area 10 (by Öngür et al. 2003)
OP11 area 11 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

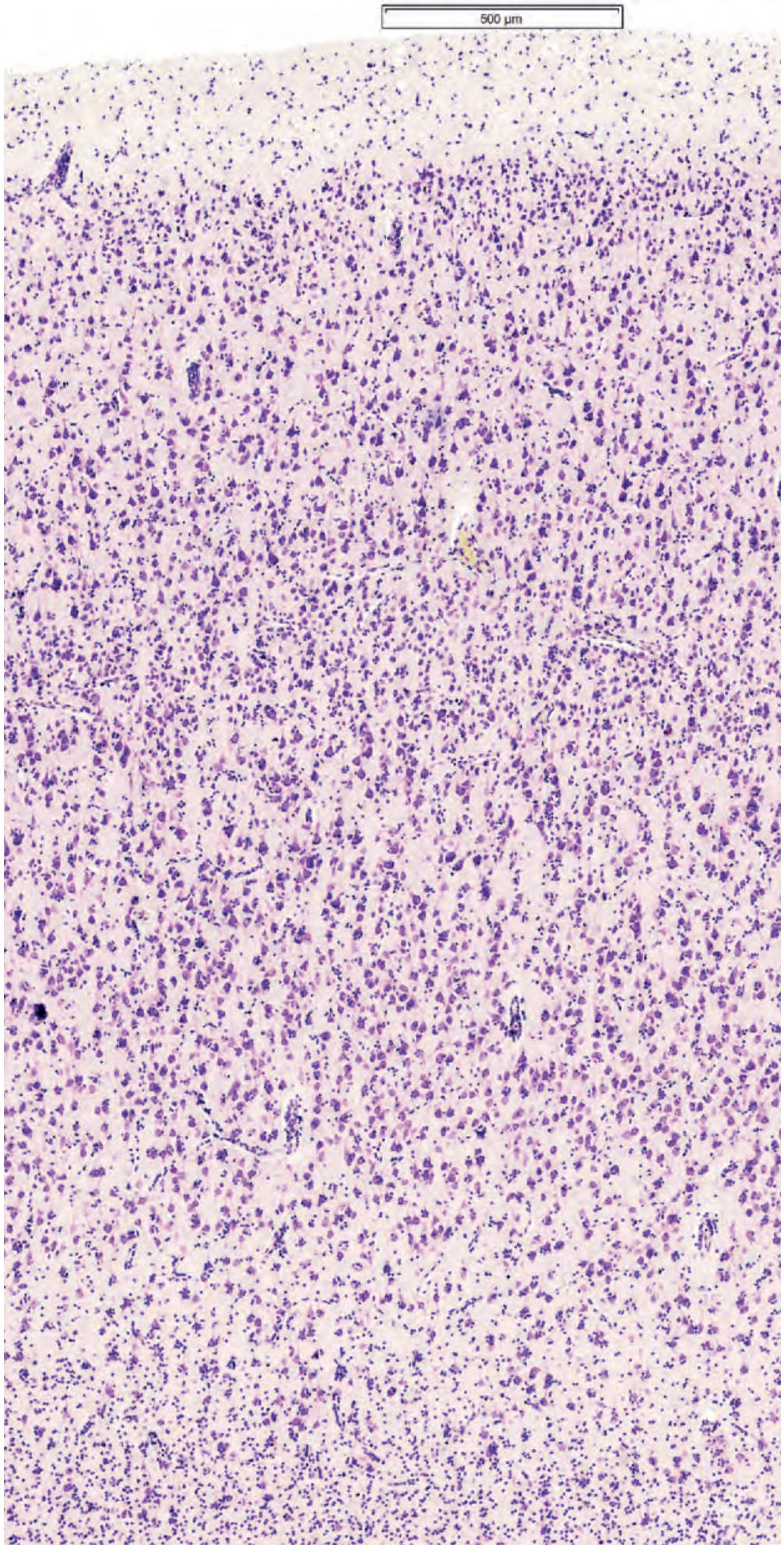
von Economo and Koskinas

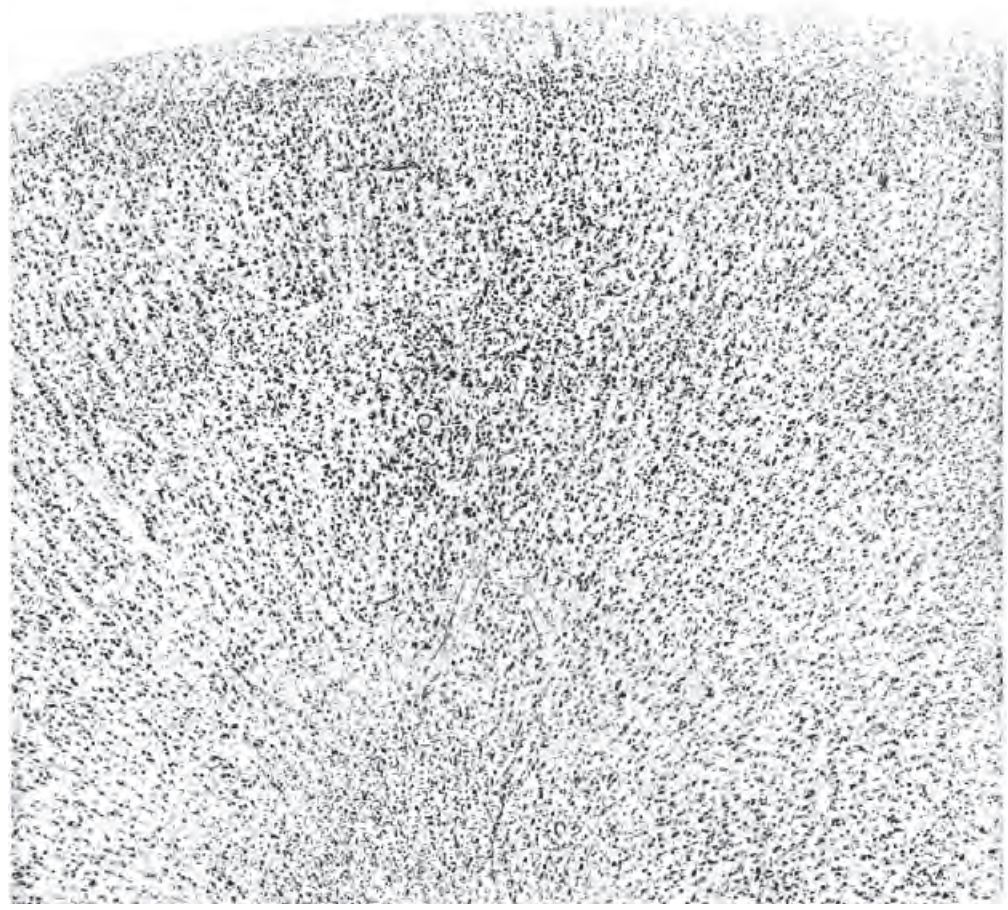
FD granular frontal area
FE frontopolar area
FFalpha+phi agranular und pretriangular orbital area

Regions of Interest

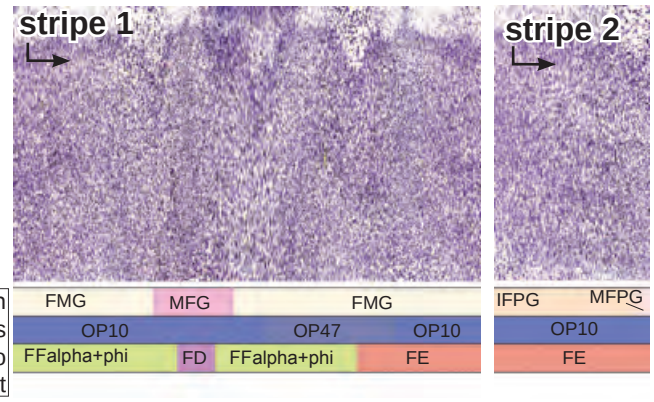
-

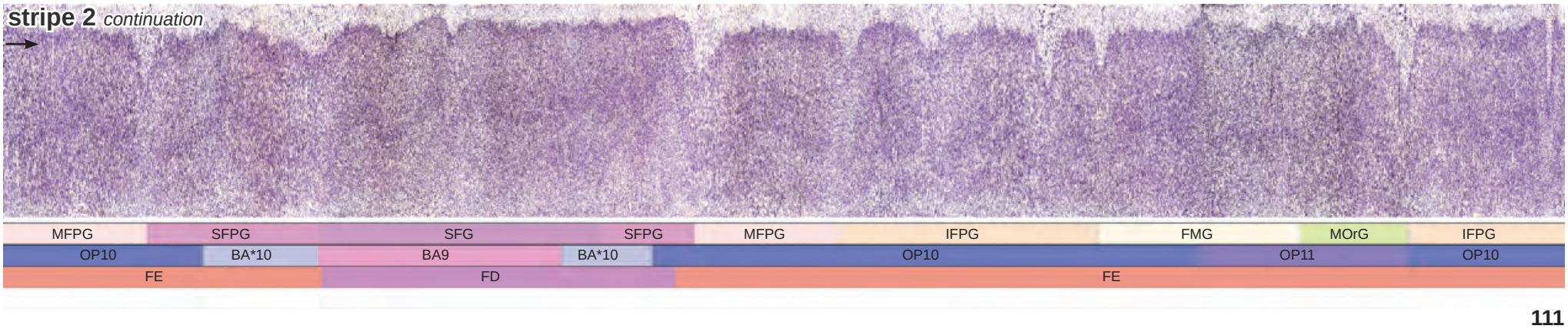
Cell stain (Nissl):
Section Nr. 3
Slice Nr. 337



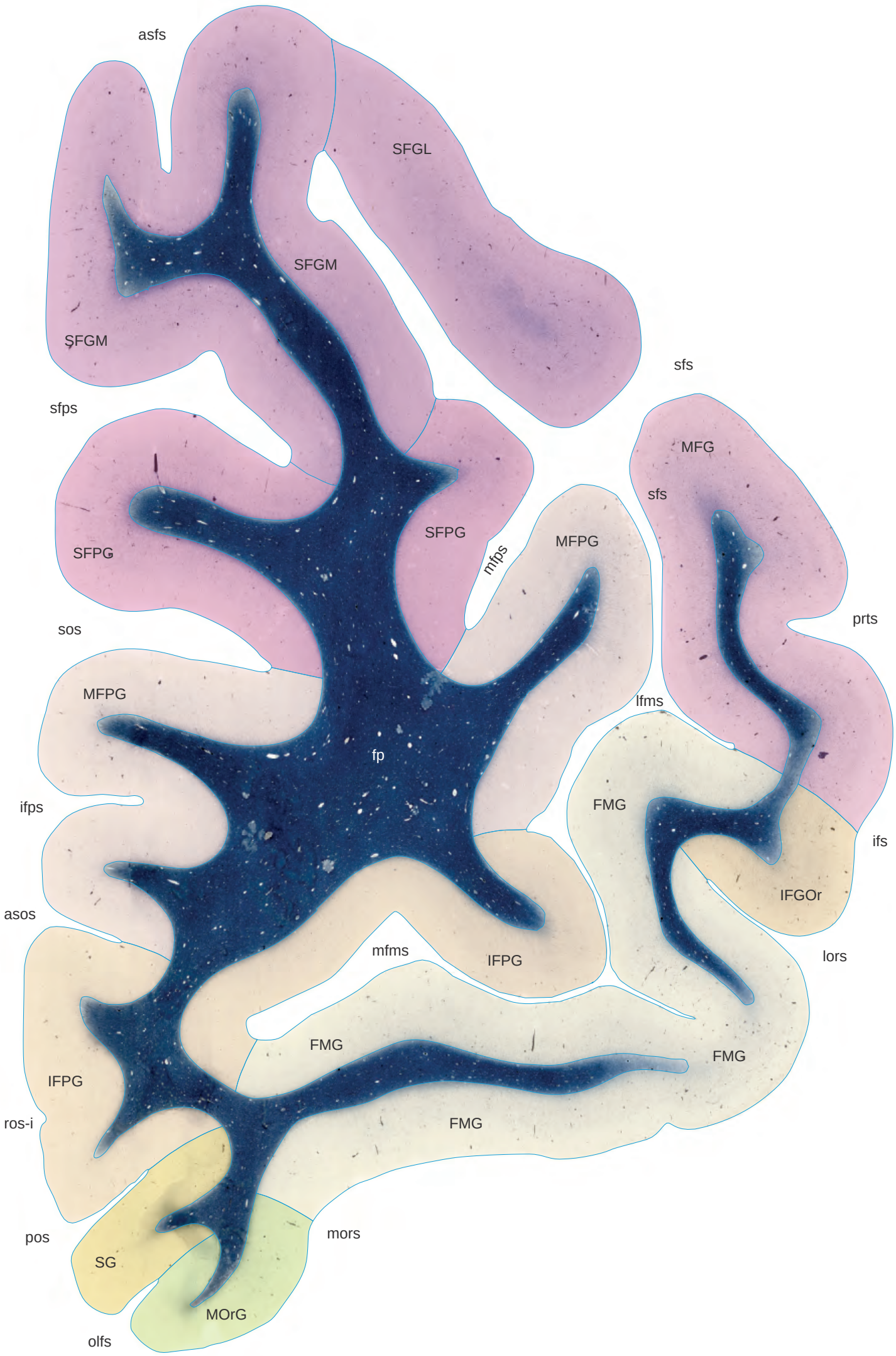


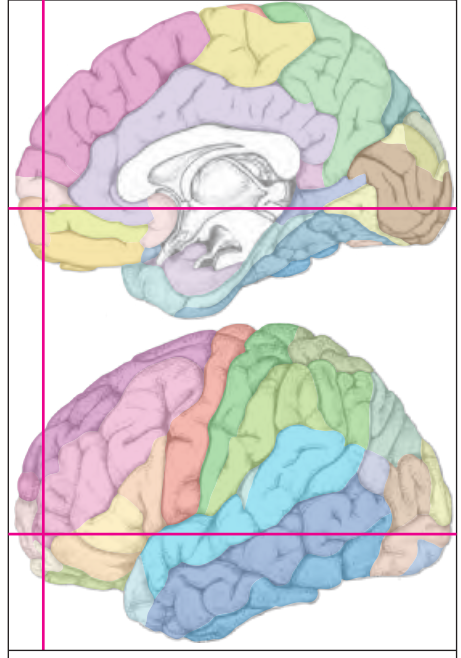
FDm(E) Area frontalis granularis magnocellularis (in limine areae frontopolaris). von Economo and Koskinas (1925) Plate XXI (21)





Cortex: Gyri and Sulci





MNI Position y = 57.91 mm
AHB Position y = -55.10 mm

Gyri

FMG frontomarginal gyrus
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
MFG medial frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Sulci

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifps inferior frontopolar sulcus
ifs inferior frontal sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
mors medial orbital sulcus
olfs olfactory sulcus
pos praeolfactory sulcus
prts pretriangular sulcus
ros-i rostral sulcus, inferior part
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos supraorbital sulcus

Fibers

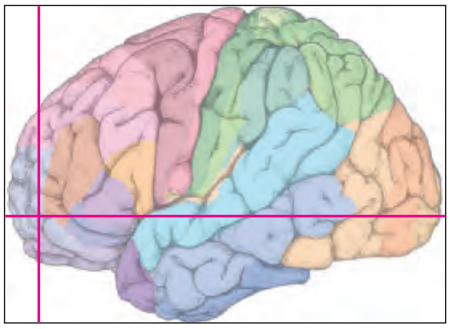
fp frontopolar fibers

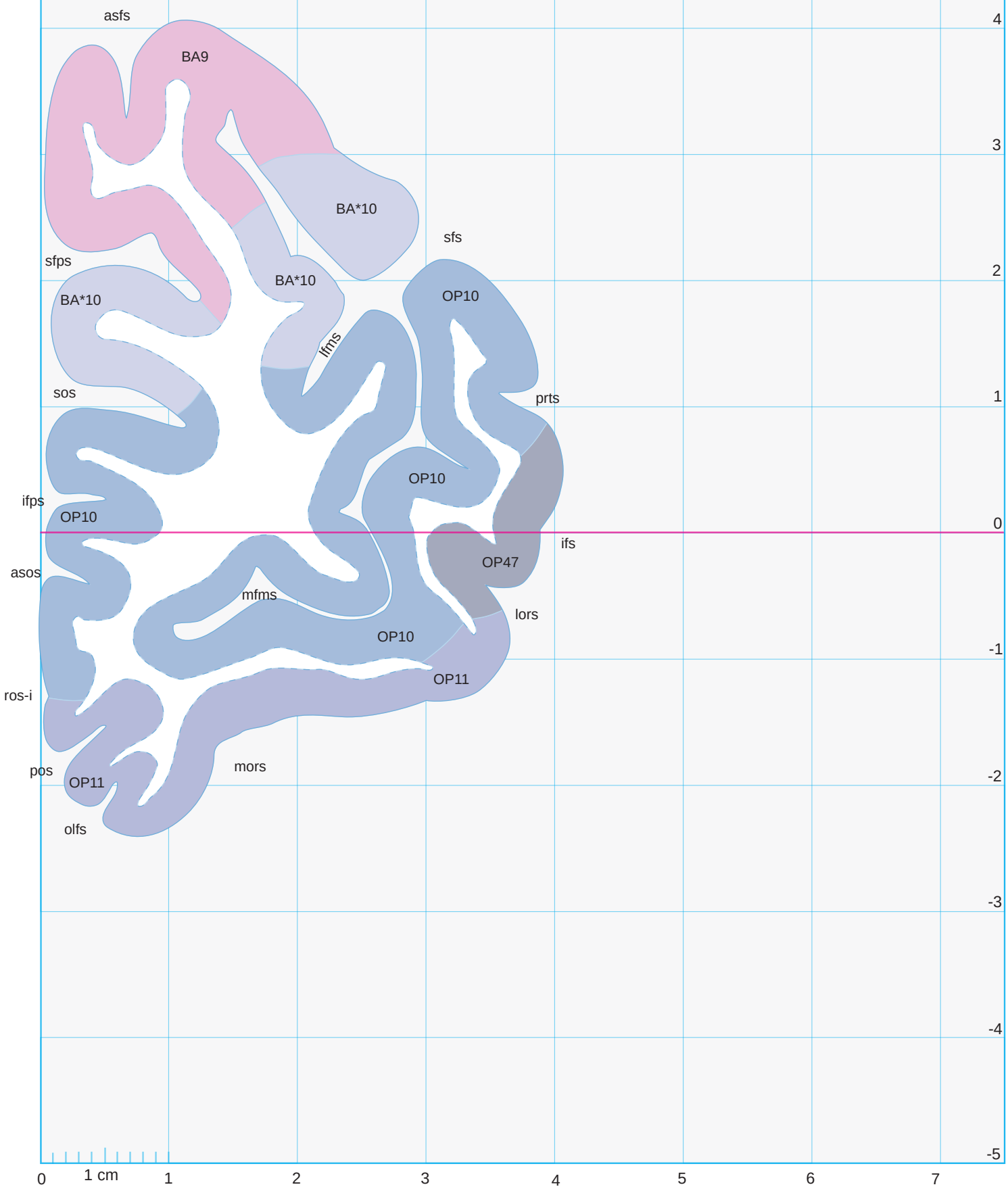
Fiber stain (Weigert)
Section Nr. 4
Slice Nr. 434

Cortex: Brodmann Areas

4

MNI: 57.91
ICL: -55.10
MCP: -69.84

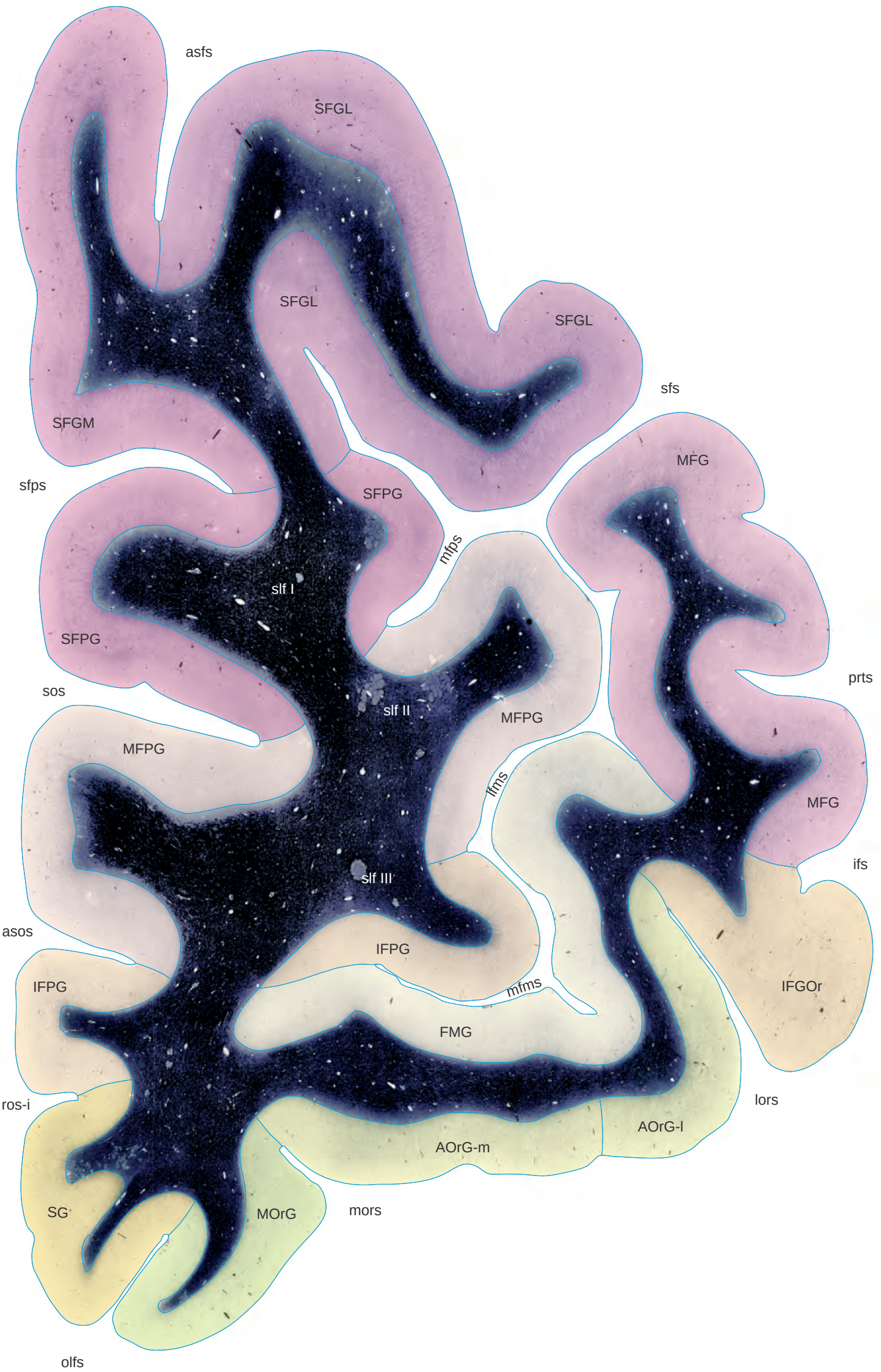


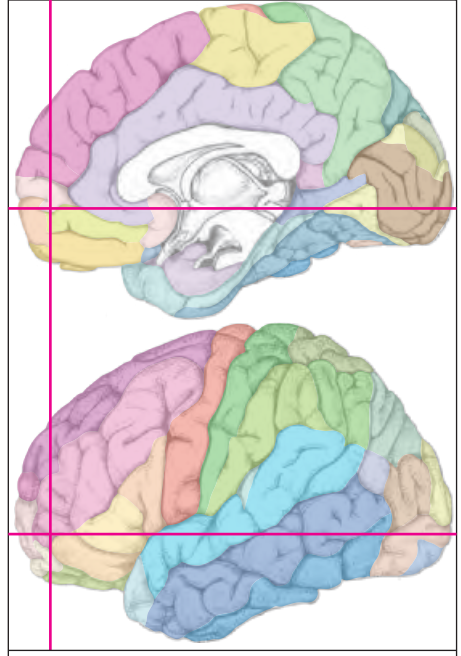


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10 see p. 101

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifps inferior frontopolar sulcus
ifs inferior frontal sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mors middle orbital sulcus
olfs olfactory sulcus
OP10,11,47 areas defined by Öngür et.al. (2003)
pos praeolfactory sulcus
prts pretriangular sulcus
ros-i rostral sulcus, inferior (lower) branch
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos superior occipital sulcus

Cortex: Gyri and Sulci





MNI Position y = 55.01 mm
AHB Position y = -52.37 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
FMG frontomarginal gyrus
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
MFG medial frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Sulci

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifs inferior frontal sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mfps middle frontopolar sulcus
mors medial orbital sulcus
olfs olfactory sulcus
prts pretriangular sulcus
ros-i rostral sulcus, inferior part
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos supraorbital sulcus

Fibers

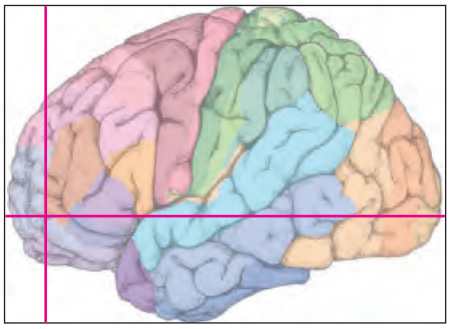
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.

Fiber stain (Weigert)
Section Nr. 5
Slice Nr. 536

Cortex: Brodmann Areas

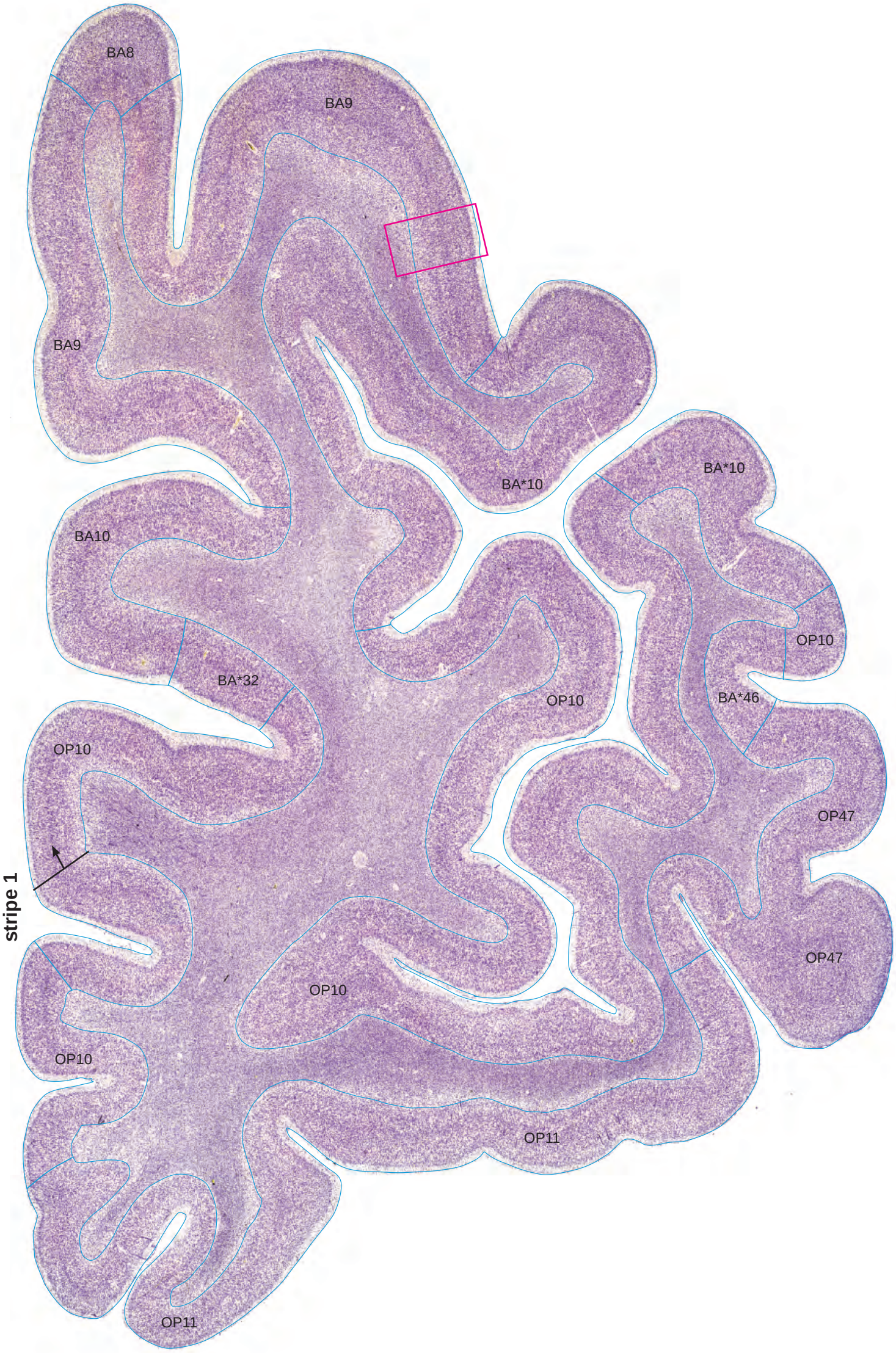
5

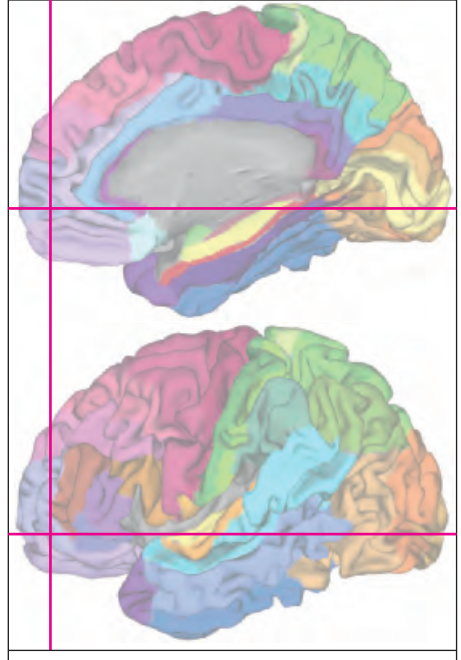
MNI: 55.01
ICL: -52.37
MCP: -67.11



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10,32,46 see p. 101

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifs inferior frontal sulcus
lors lateral orbital sulcus
mors middle orbital sulcus
olfs olfactory sulcus
OP 10,11,47 areas defined by Öngür et.al. (2003)
prts pretriangular sulcus
ros-i rostral sulcus, inferior (lower) branch
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos superior occipital sulcus





MNI Position y = 54.98 mm
AHB Position y = -52.34 mm

Gyral Pattern

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
FMG frontomarginal gyrus
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
MFG medial frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Brodmann Areas

BA8 area frontalis intermedia
BA9 area frontalis granularis
BA10 area frontopolaris
BA32 area cingularis anterior dorsalis
BA46 area frontalis media
OP10 area 10 (by Öngür et al. 2003)
OP11 area 11 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

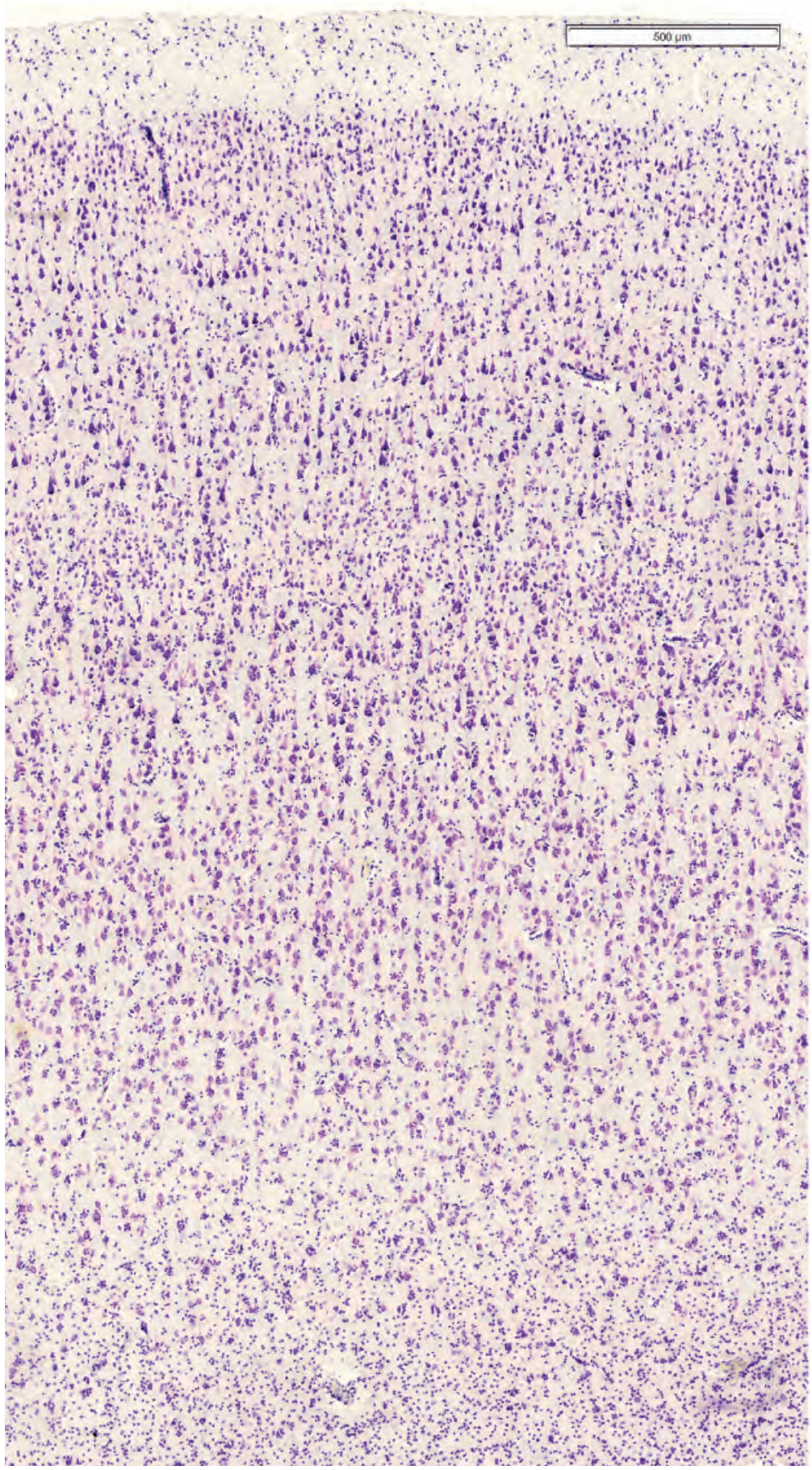
von Economo and Koskinas

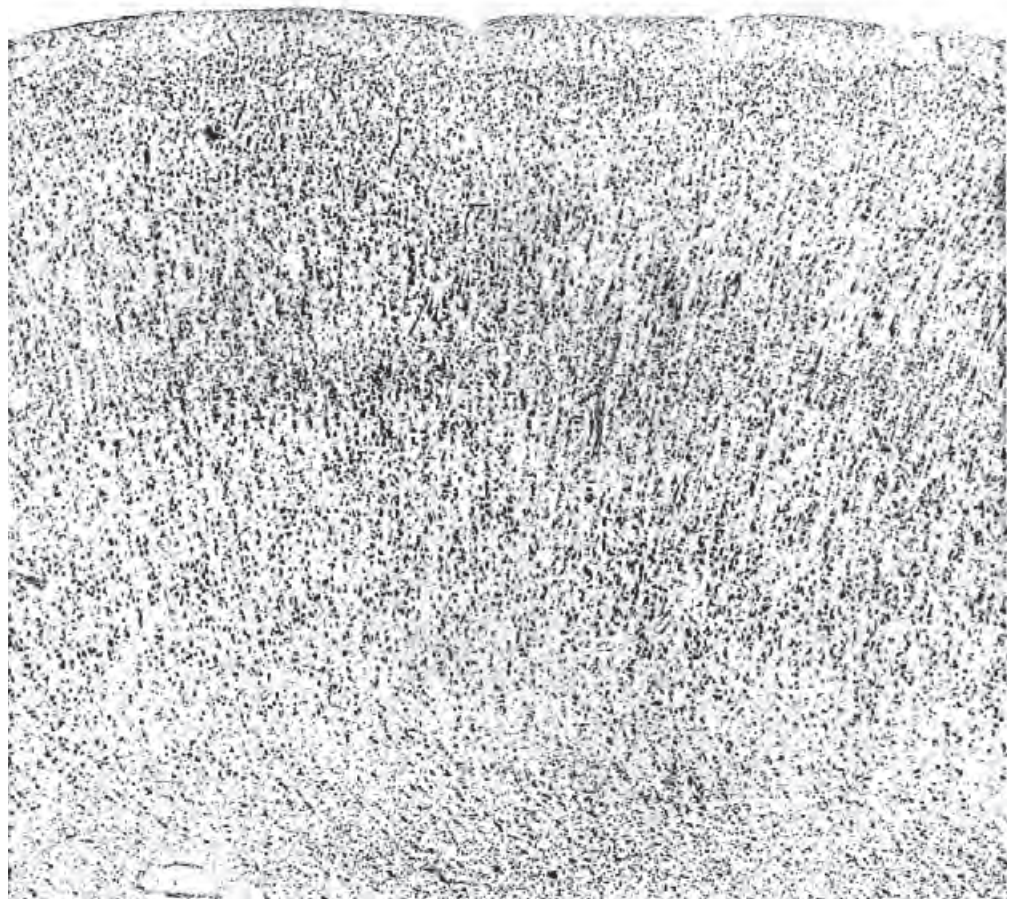
FD granular frontal area
FDdelta middle granular frontal area
FE frontopolar area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FG area of straight gyrus (area recta)

Regions of Interest

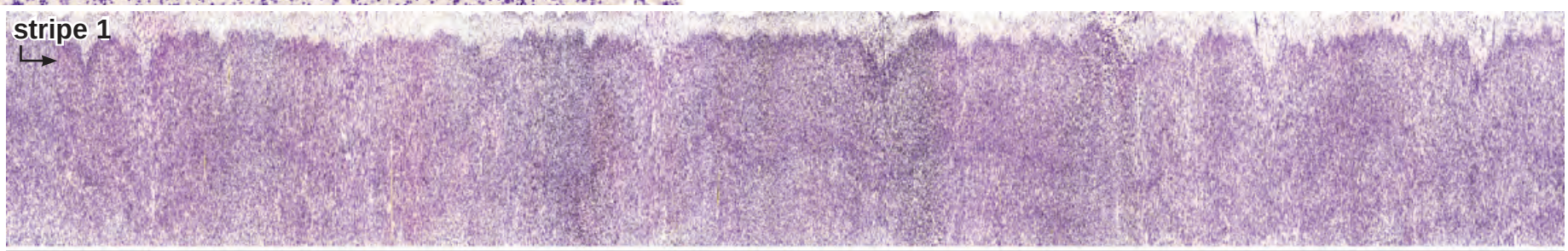
B. Vogt:
24c subregion of BA 24

Cell stain (Nissl):
Section Nr. 5
Slice Nr. 537

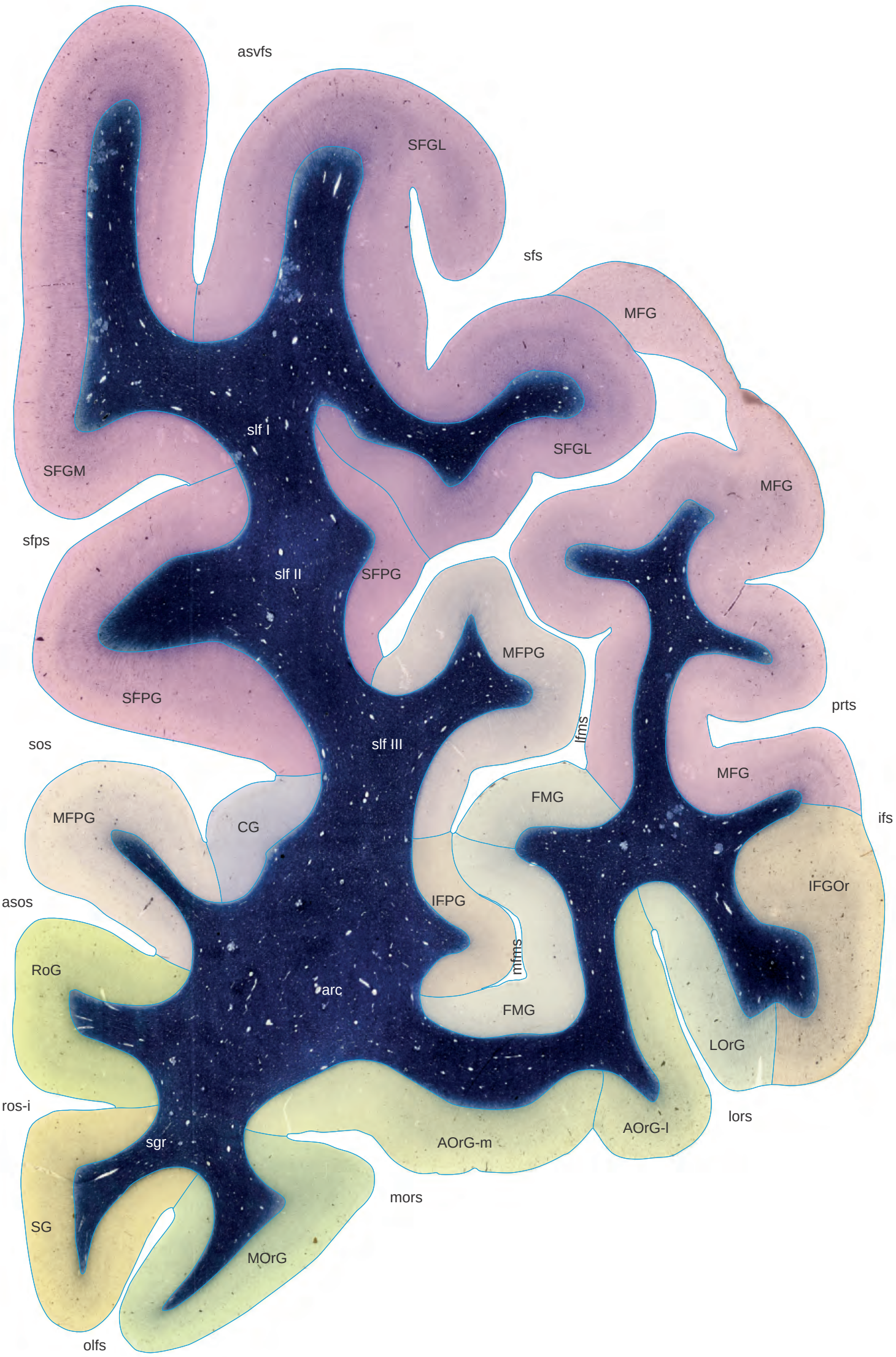


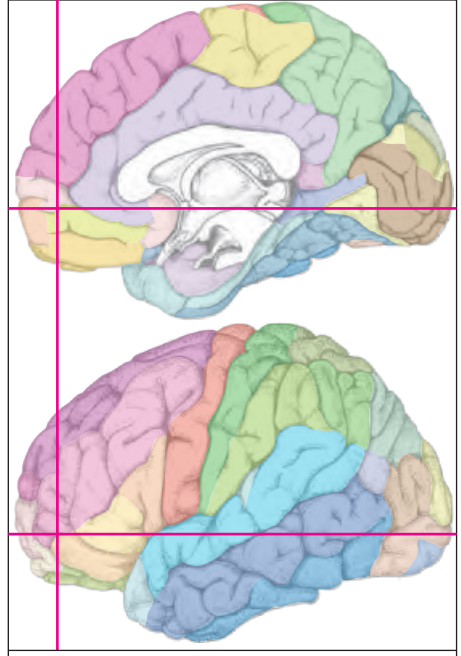


FDm and FDC Area frontalis granularis rnagnocellularis et in limine areae frontalis intermediae. von Economo and Koskinas (1925) Plate XX (20)



| | | |





MNI Position y = 52.16 mm
AHB Position y = -49.66 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
CG cingulate gyrus
FMG frontomarginal gyrus
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Sulci

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifs inferior frontal sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mfms medial frontomarginal sulcus
mors medial orbital sulcus
olfs olfactory sulcus
prts pretriangular sulcus
ros-i rostral sulcus, inferior part
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos supraorbital sulcus

Fibers

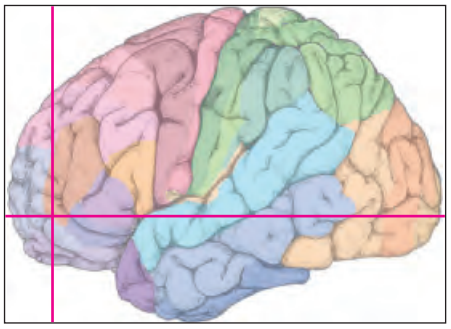
arc arcuate fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.

Fiber stain (Weigert)
Section Nr. 6
Slice Nr. 637

Cortex: Brodmann Areas

6

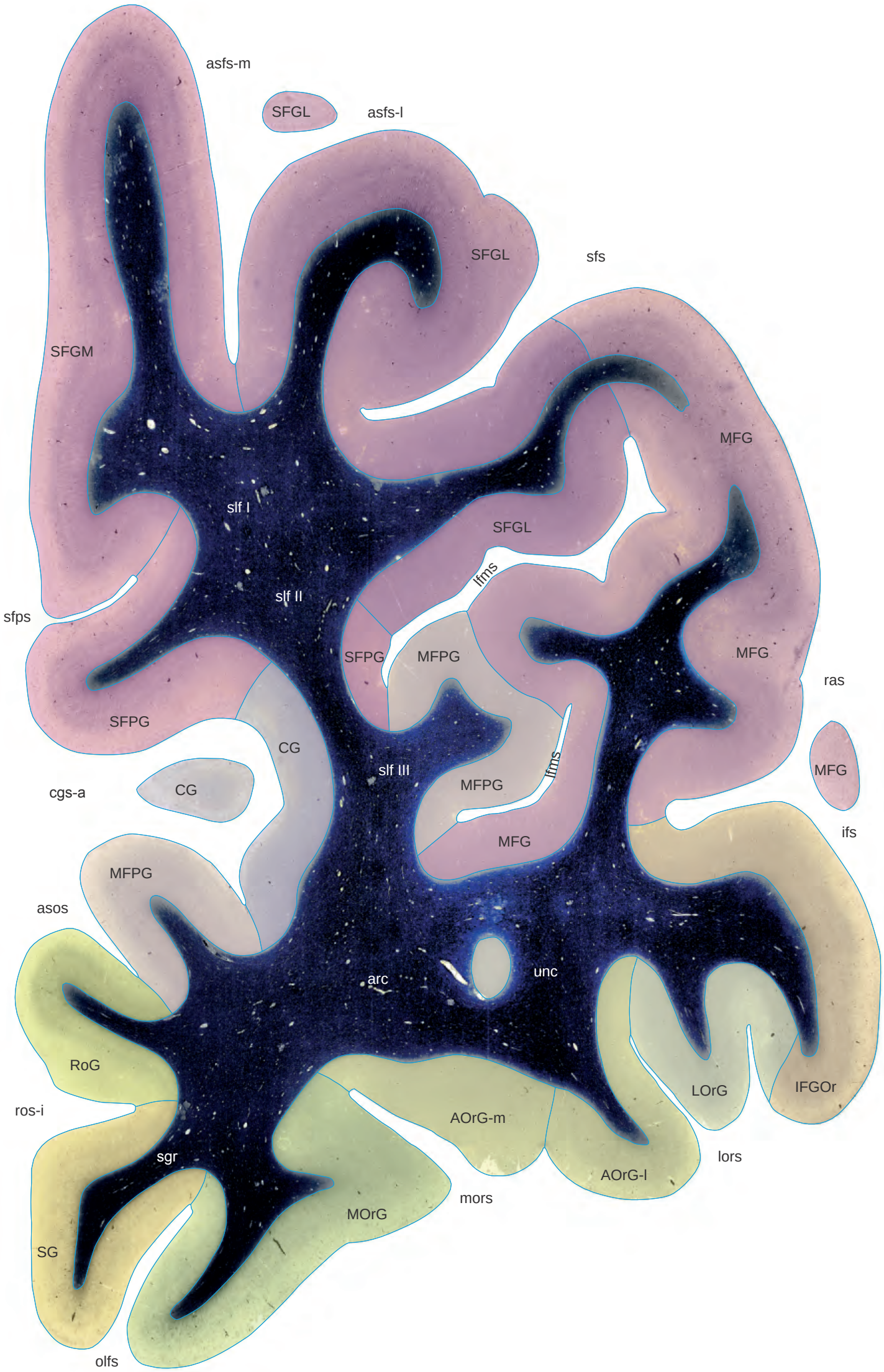
MNI: 52.16
ICL: -49.66
MCP: -64.40

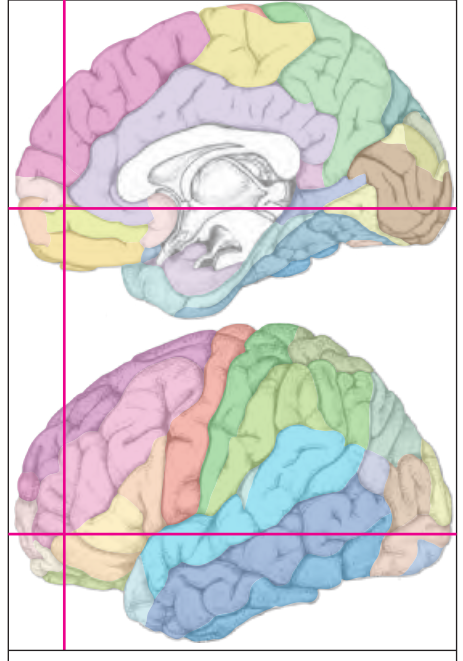


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10,32,46 see p. 101

asfs accessory superior frontal sulcus
asos accessory supraorbital sulcus
ifs inferior frontal sulcus
lors lateral orbital sulcus
mors middle orbital sulcus
olfs olfactory sulcus
OP 10,11,47 areas defined by Öngür et.al. (2003)
prts pretriangular sulcus
ros-i rostral sulcus, inferior (lower) branch
sfps superior frontopolar sulcus
sfs superior frontal sulcus
sos superior occipital sulcus

Cortex: Gyri and Sulci





MNI Position y = 49.35 mm
AHB Position y = -46.98 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Sulci

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
asos accessory supraorbital sulcus
cgs-a cingulate sulcus, anterior part
ifs inferior frontal sulcus
lfms lateral frontomarginal sulcus
lors lateral orbital sulcus
mors medial orbital sulcus
olfs olfactory sulcus
ras radiate sulcus
ros-i rostral sulcus, inferior part
sfps superior frontopolar sulcus
sfs superior frontal sulcus

Fibers

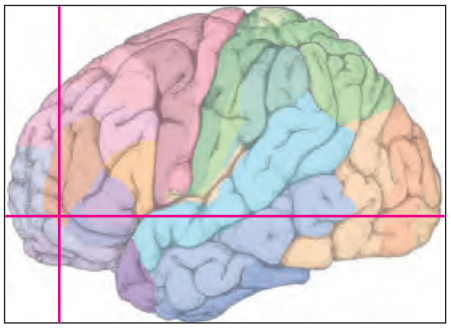
arc arcuate fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

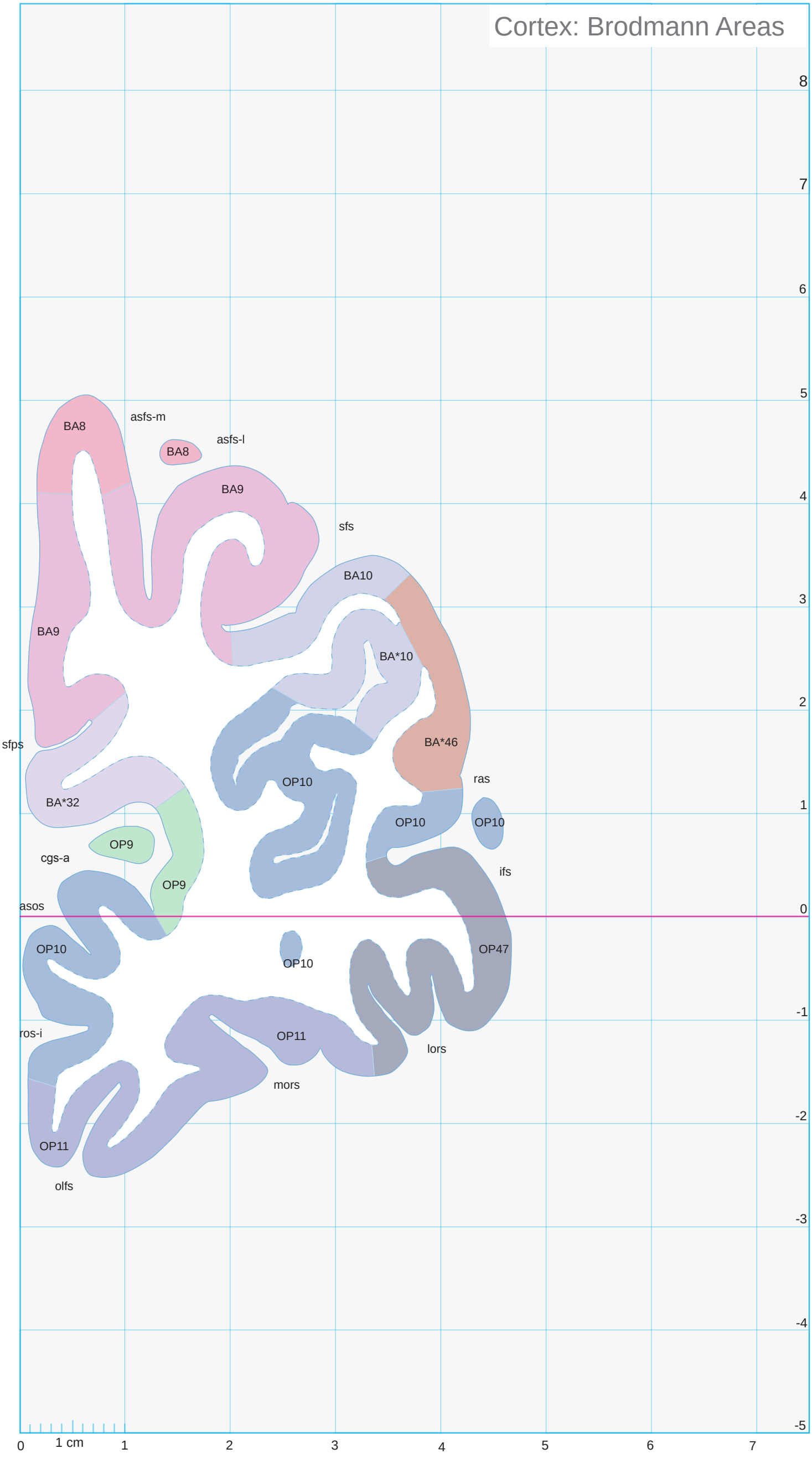
Fiber stain (Weigert)
Section Nr. 7
Slice Nr. 737

Cortex: Brodmann Areas

7

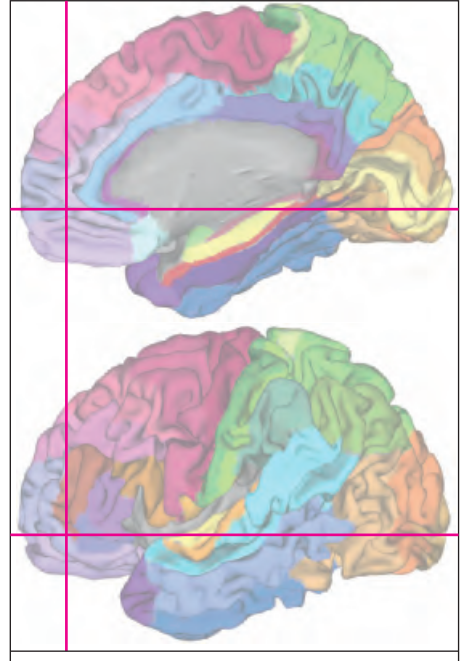
MNI: 49.35
ICL: -46.98
MCP: -61.72





BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10,32,46 see p. 101

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
asos accessory supraorbital sulcus
cgs-a cingulate sulcus, anterior p.
ifs inferior frontal sulcus
lors lateral orbital sulcus
mors middle orbital sulcus
olfs olfactory sulcus
OP 9,10,11,47 areas defined by Öngür et.al. (2003)
ras radiate sulcus (Eberstaller)
ros-i rostral sulcus, inferior (lower) branch
sfps superior frontopolar sulcus
sfs superior frontal sulcus



MNI Position y = 49.32 mm
AHB Position y = -46.95 mm

Gyral Pattern

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Brodmann Areas

BA8 area frontalis intermedia
BA9 area frontalis granularis
BA10 area frontopolaris
BA32 area cingularis anterior dorsalis
BA46 area frontalis media
OP9 area 9 (by Öngür et al. 2003)
OP10 area 10 (by Öngür et al. 2003)
OP11 area 11 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

von Economo and Koskinas

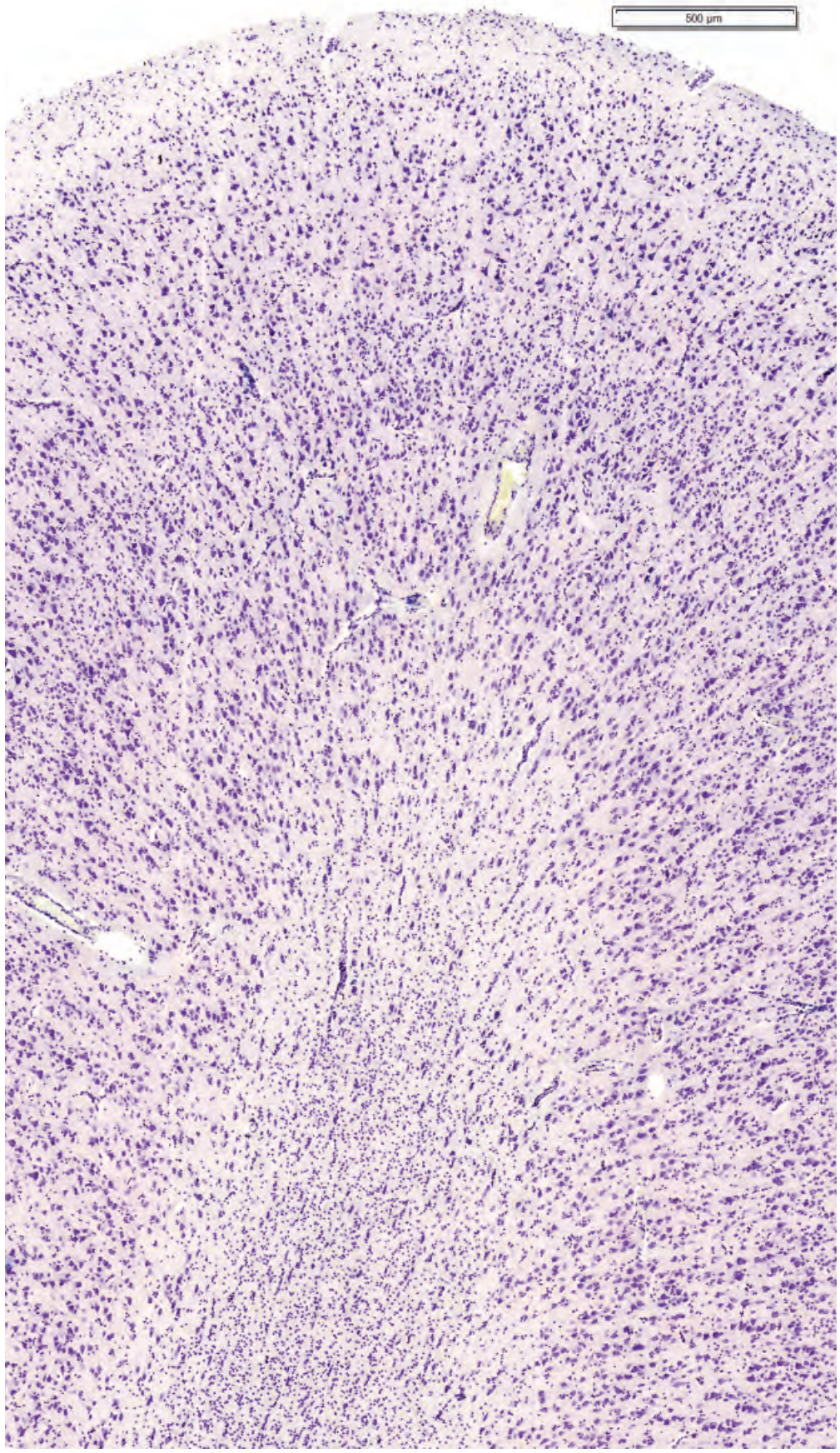
FD granular frontal area
FDdelta middle granular frontal area
FE frontopolar area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FG area of straight gyrus (area recta)

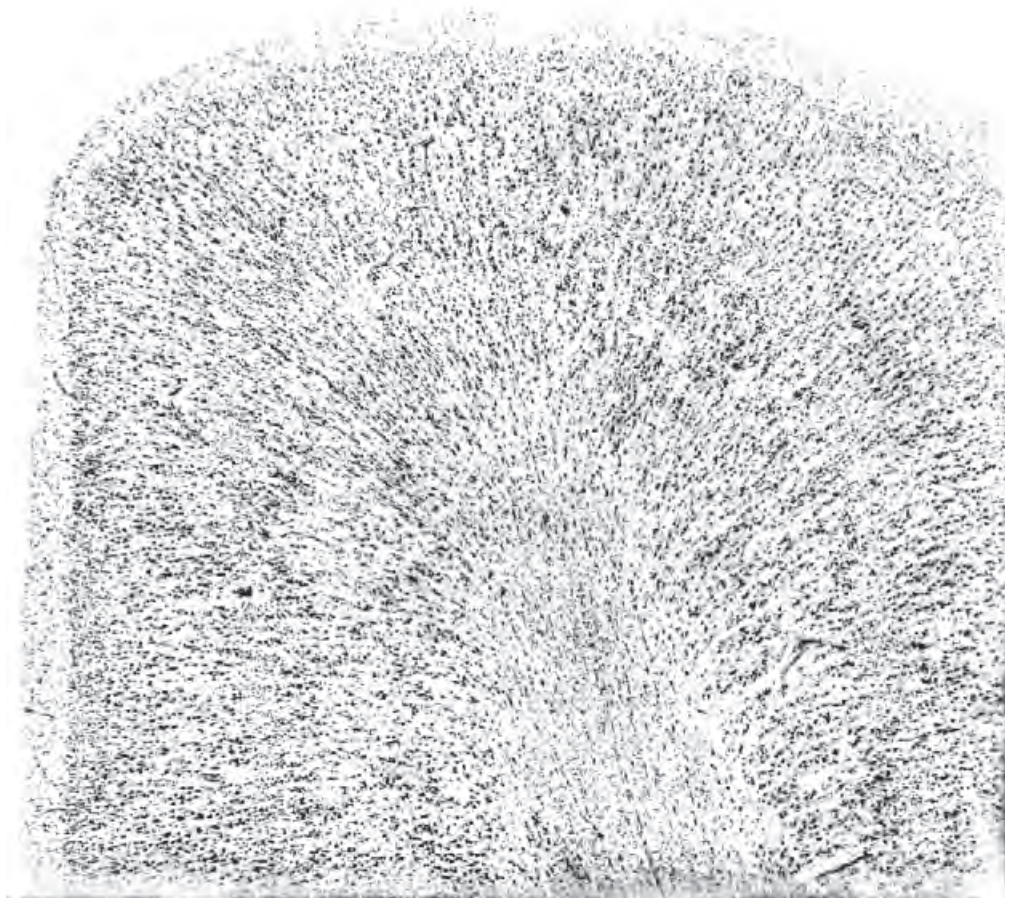
Regions of Interest

B. Vogt:
24c subregion of BA 24

BA8
BA8
BA9
BA10
BA9
BA*10
BA*46
BA*32
stripe 1
OP10
OP10
OP9
OP9
stripe 2
OP10
OP10
OP47
OP11
OP11
OP11

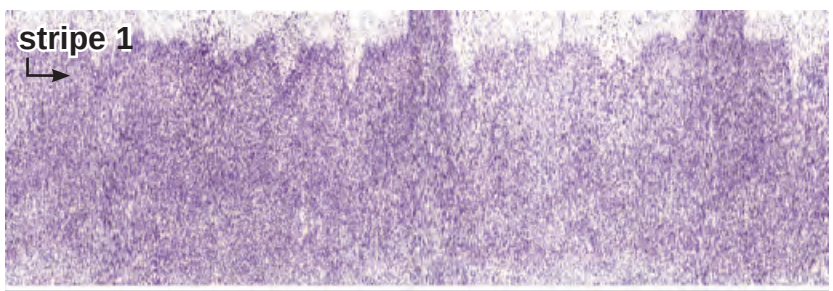
Cell stain (Nissl):
Section Nr. 7
Slice Nr. 738

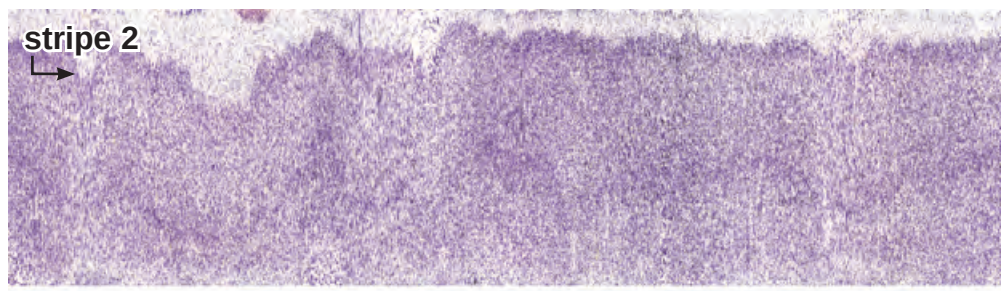




FG Area recta.

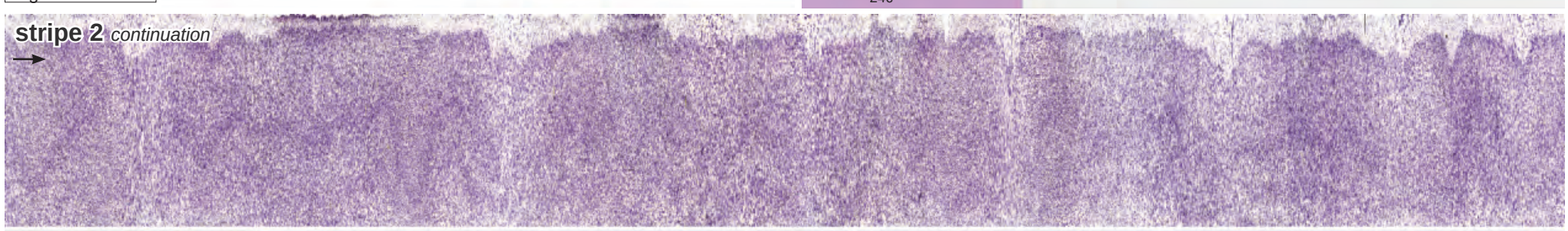
von Economo and Koskinas (1925) Plate XXXV (35)





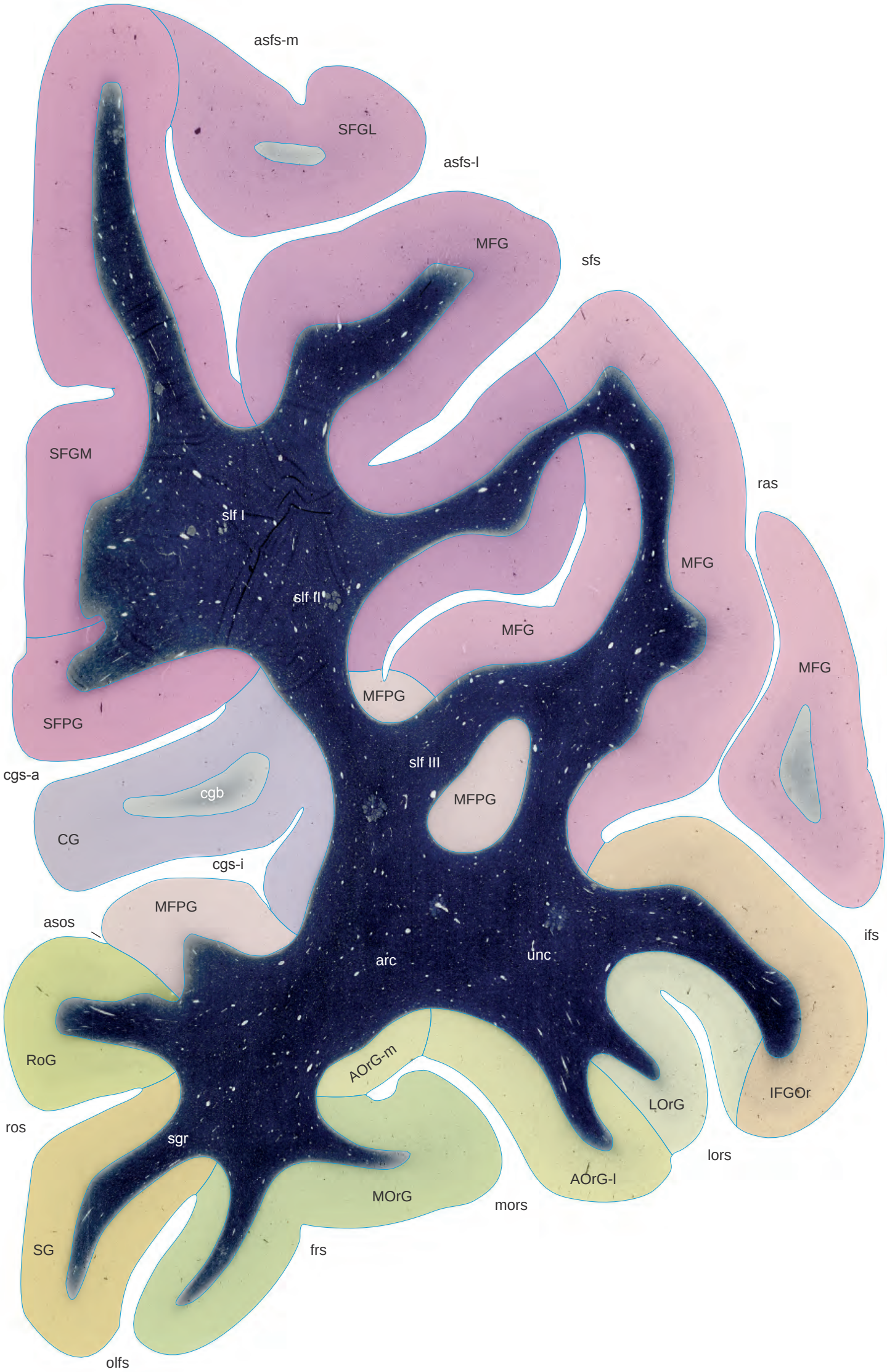
Gyral pattern						
Brodmann areas	SFPG	SFGL	MFG		MFPG	SFPG
von Economo	OP10	BA*10	OP10			
Regions of Interest	FD	FDdelta	FD	FFalpha+phi	FE	FD

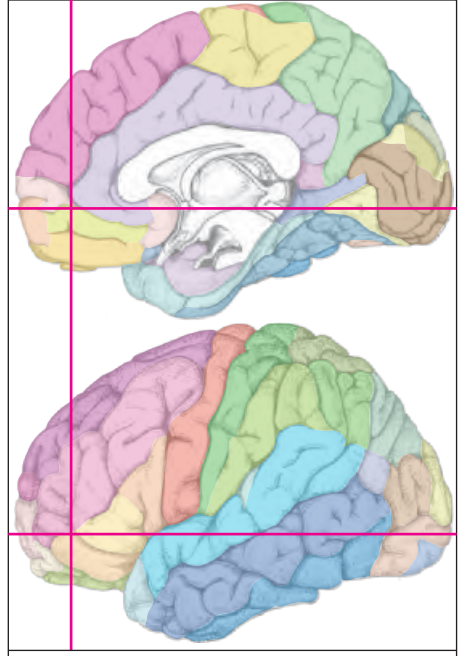
MFPG	CG	SFPG	SFGM		SFGL
OP10	OP9	BA*32	BA9	BA8	BA9
FE			FD		
24c					



SFGL	MFG	IFGOr	LOrG	AOrG-l	AOrG-m	MOrG	SG	RoG	MFPG	
BA9	BA10	BA*46	OP10	OP47		OP11		OP10		
FD			FFalpha+phi	FF	FE		FG	FE		
24c										

Cortex: Gyri and Sulci





MNI Position y = 46.53 mm
AHB Position y = -44.35 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
AOrG-m anterior orbital gyrus, medial part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SFPG superior frontopolar gyrus
SG straight gyrus

Sulci

asos accessory supraorbital sulcus
asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
frs fragmentosus sulcus
ifs inferior frontal sulcus
lors lateral orbital sulcus
mors medial orbital sulcus
olfs olfactory sulcus
ras radiate sulcus
ros rostral sulcus
sfs superior frontal sulcus

Fibers

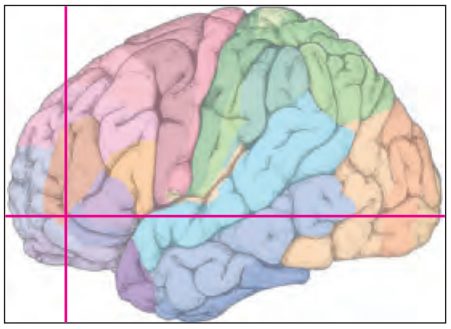
arc arcuate fascicle
cgb cingulum bundle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 8
Slice Nr. 835

Cortex: Brodmann Areas

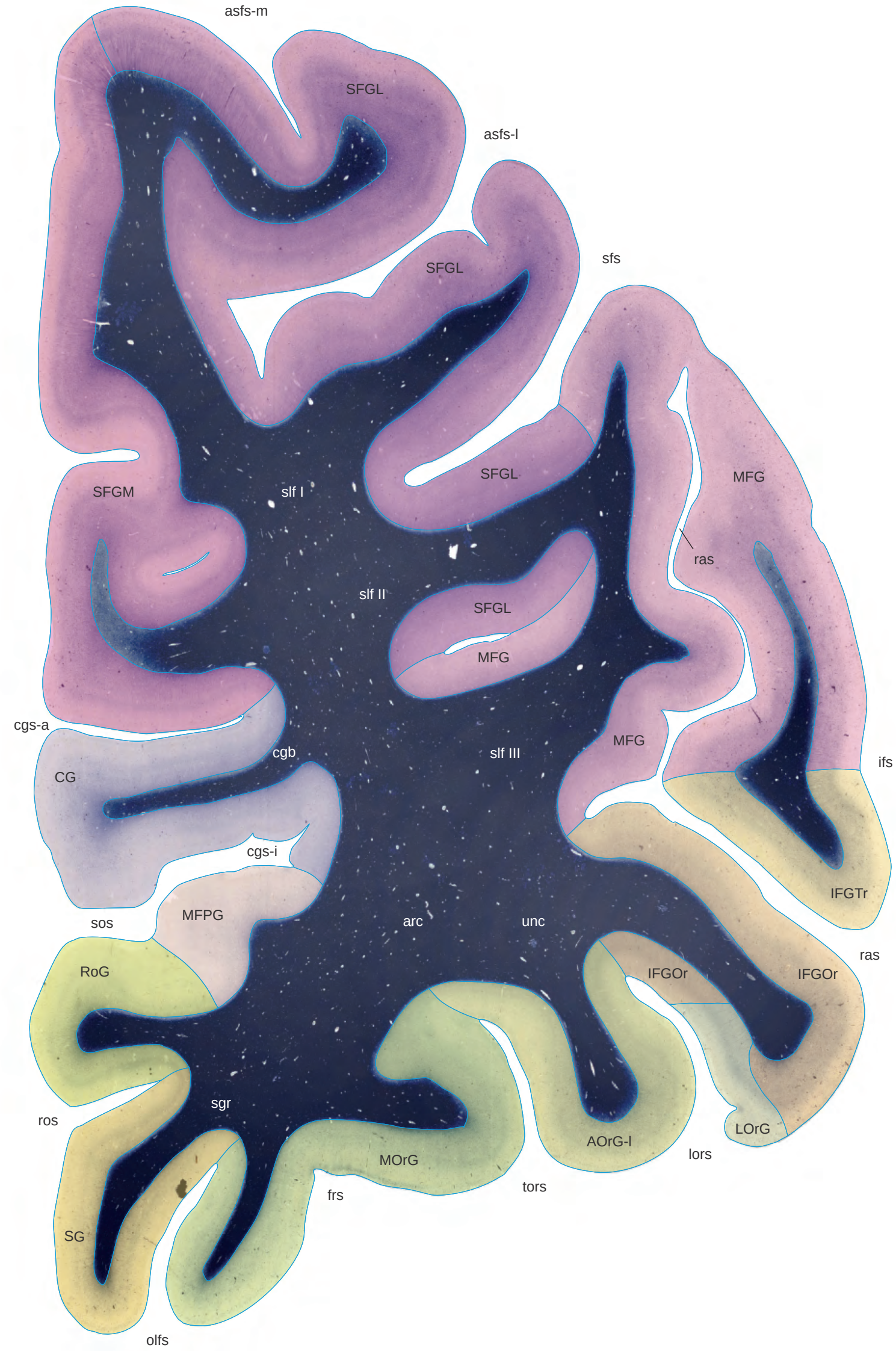
8

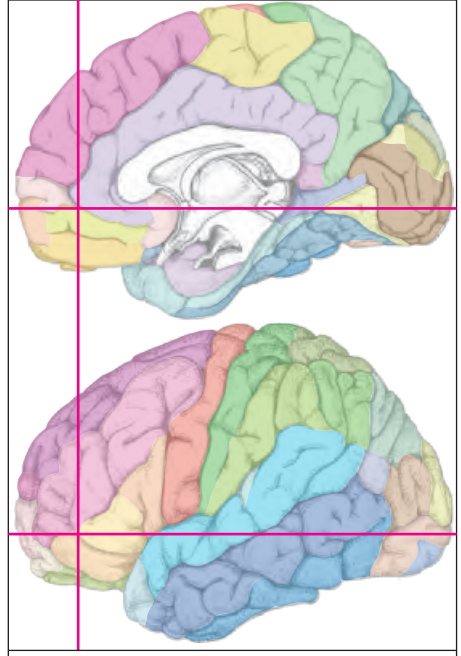
MNI: 46.53
ICL: -44.35
MCP: -59.09



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA10,32,46 see p. 101

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
asos accessory supraorbital sulcus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
frs fragmentosus sulcus
ifs inferior frontal sulcus
lors lateral orbital sulcus
mors middle orbital sulcus
olfs olfactory sulcus
OP 9,10,11,32,47 areas defined by Öngür et.al. (2003)
ras radiate sulcus (Eberstaller)
ros rostral sulcus
sfs superior frontal sulcus





MNI Position y = 43.72 mm
AHB Position y = -41.62 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Sulci

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
frs fragmentosus sulcus
ifs inferior frontal sulcus
lors lateral orbital sulcus
olfs olfactory sulcus
ras radiate sulcus
ros rostral sulcus
sfs superior frontal sulcus
sos supraorbital sulcus
tors transverse orbital sulcus

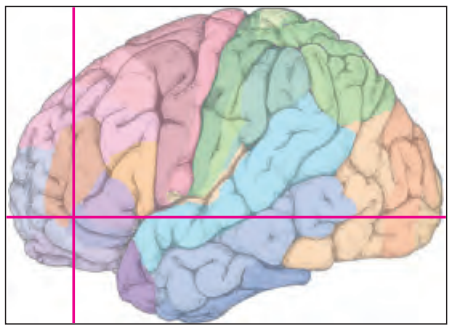
Fibers

arc arcuate fascicle
cgb cingulum bundle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 9
Slice Nr. 937

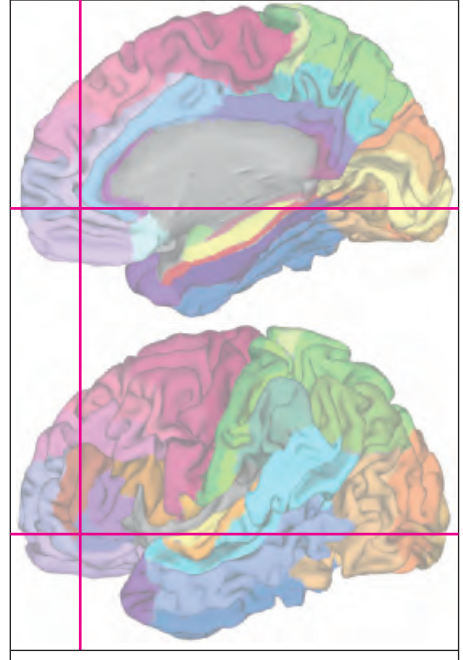
Cortex: Brodmann Areas

MNI: 43.72
ICL: -41.62
MCP: -56.36



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA32,46 see p. 101

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
frs fragmentosus sulcus
ifs inferior frontal sulcus
lf-h lateral fissure, horizontal ramus
lors lateral orbital sulcus
olfs olfactory sulcus
OP 9,10,11,32,47 areas defined by Öngür et.al. (2003)
ros rostral sulcus
sfs superior frontal sulcus
sos superior occipital sulcus
tors transverse orbital sulcus



MNI Position y = 43.69 mm
AHB Position y = -41.59 mm

Gyral Pattern

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOrG medial orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Brodmann Areas

BA8 area frontalis intermedia
BA9 area frontalis granularis
BA10 area frontopolaris
BA32 area cingularis anterior dorsalis
BA46 area frontalis media
OP9 area 9 (by Öngür et al. 2003)
OP10 area 10 (by Öngür et al. 2003)
OP11 area 11 (by Öngür et al. 2003)
OP32 area 32 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

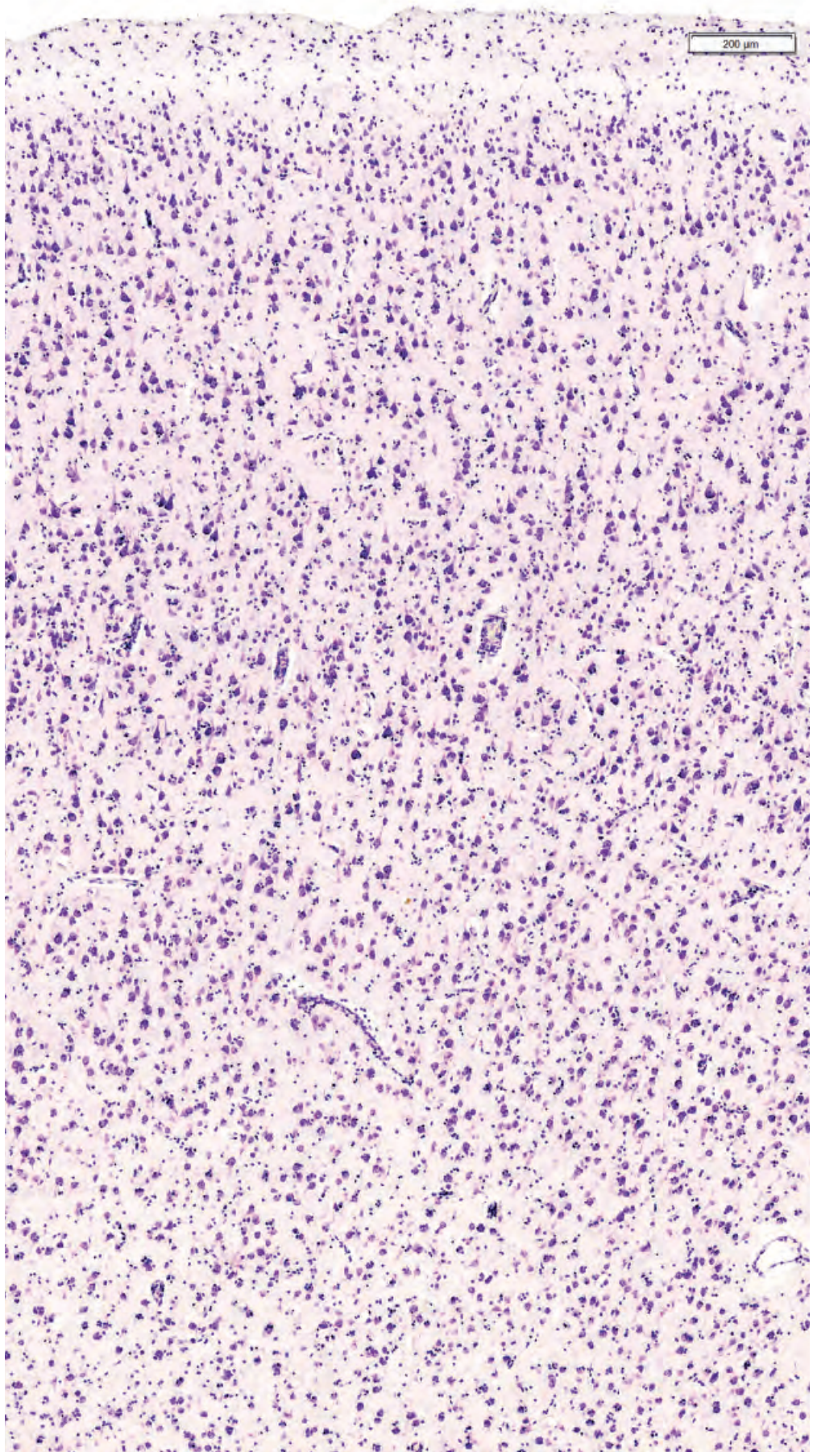
von Economo and Koskinas

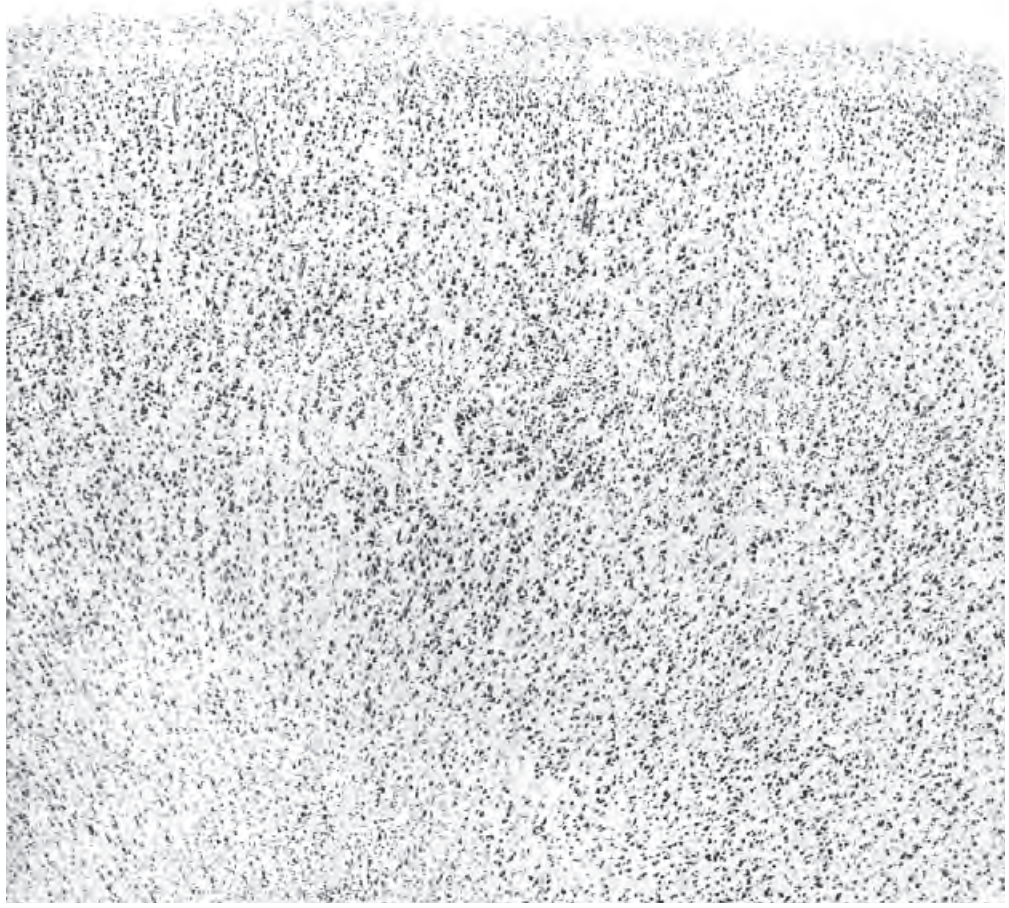
FD granular frontal area
FDdelta middle granular frontal area
FDgamma+op triangular and opercular granular frontal area
FE frontopolar area
FEL limbic frontopolar area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FG area of straight gyrus (area recta)
LA2 anterior cingulate agranular anterior limbic area

Regions of Interest

B. Vogt:
24c subregion of BA 24
p24 posterior division of BA24

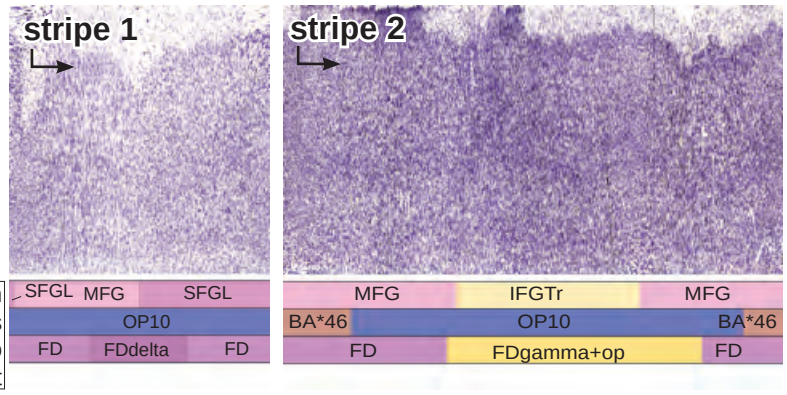
Cell stain (Nissl):
Section Nr. 9
Slice Nr. 938

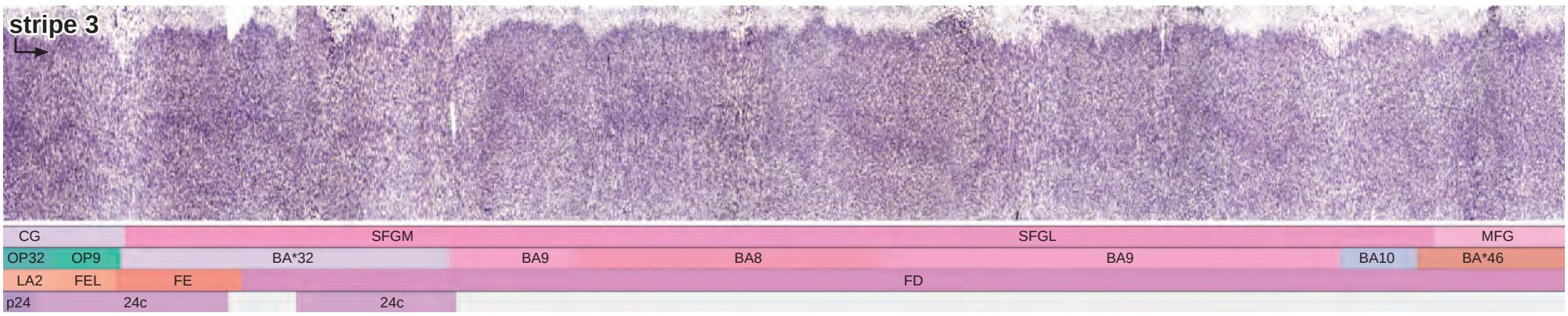


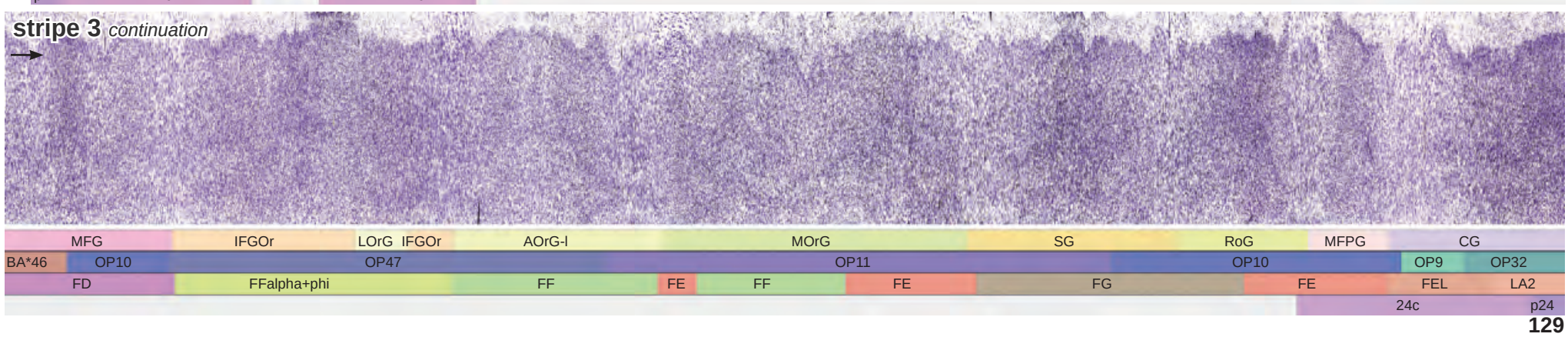


FDL Area frontalis granularis limbica.

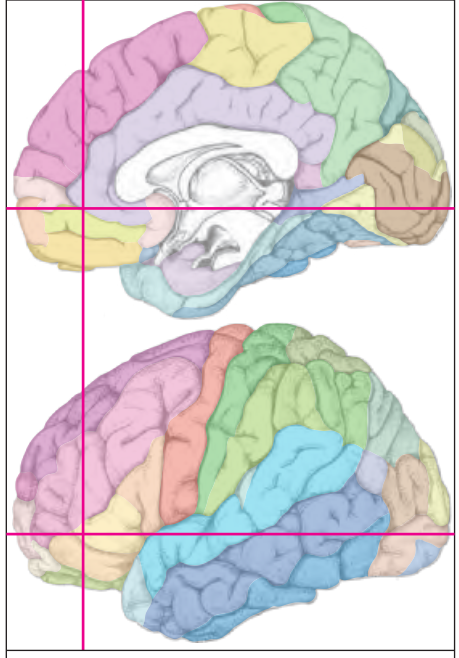
von Economo and Koskinas (1925) Plate XXVI (26)



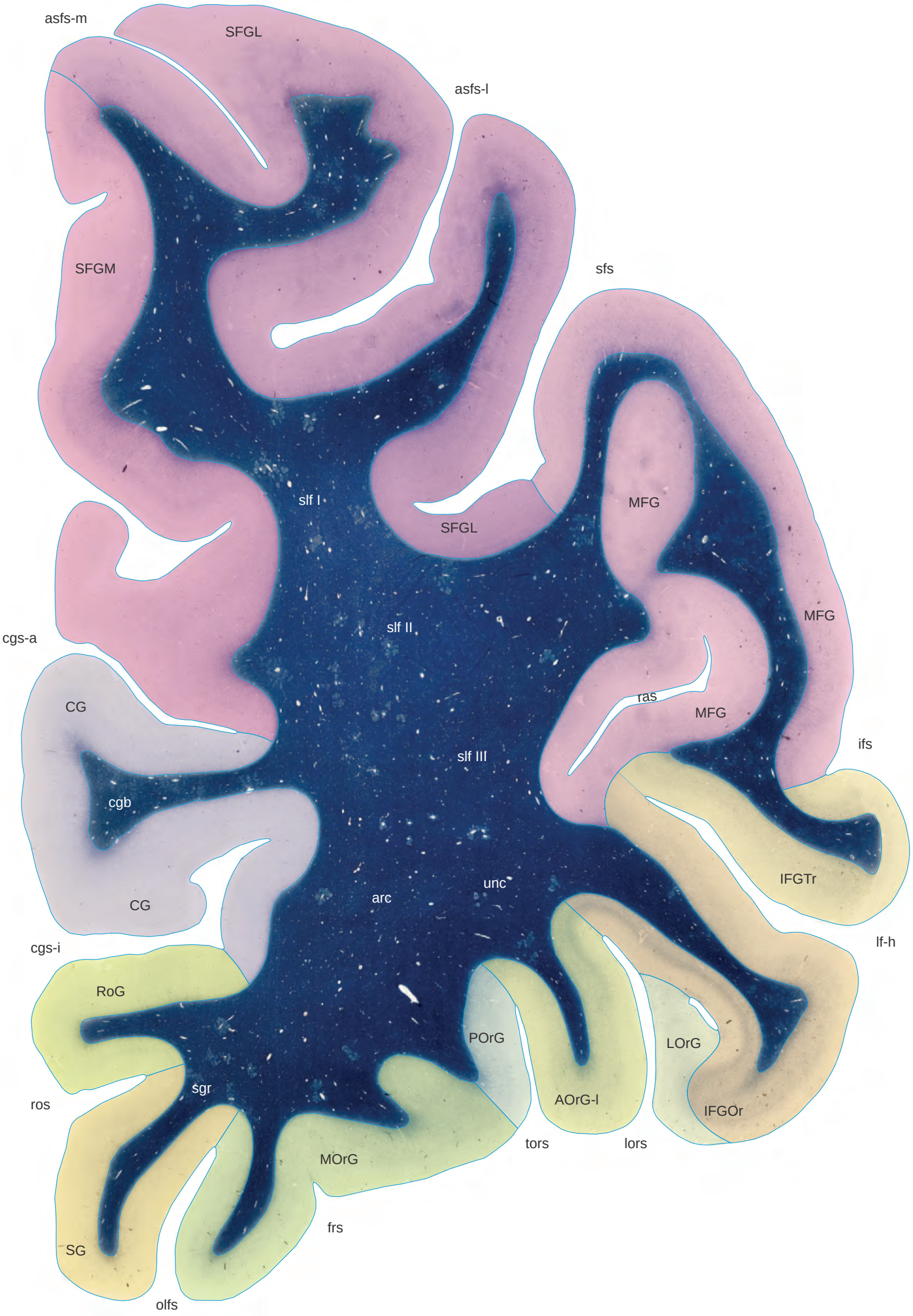



stripe 3 continuation
MFG IFGOr LOrG IFGOr AOrG-l MOrG SG RoG MFPG CG
BA*46 OP10 OP47 OP11 OP10 OP9 OP32
FD FFalpha+phi FF FE FF FE FG FE FEL LA2
24c p24

Cortex: Gyri and Sulci



MNI Position y = 40.93 mm
AHB Position y = -38.94 mm



Gyri

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Sulci

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
frs fragmentosus sulcus
ifs inferior frontal sulcus
lf-h horizontal ramus of lateral fissure
lors lateral orbital sulcus
olfs olfactory sulcus
ras radiate sulcus
ros rostral sulcus
sfs superior frontal sulcus
tors transverse orbital sulcus

Fibers

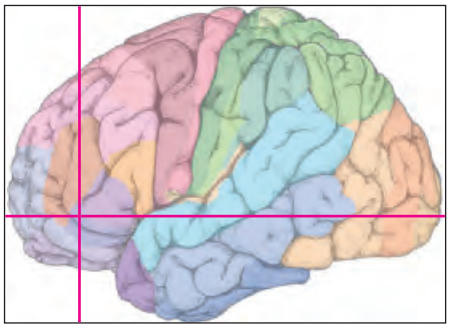
arc arcuate fascicle
cgb cingulum bundle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 10
Slice Nr. 1037

Cortex: Brodmann Areas

10

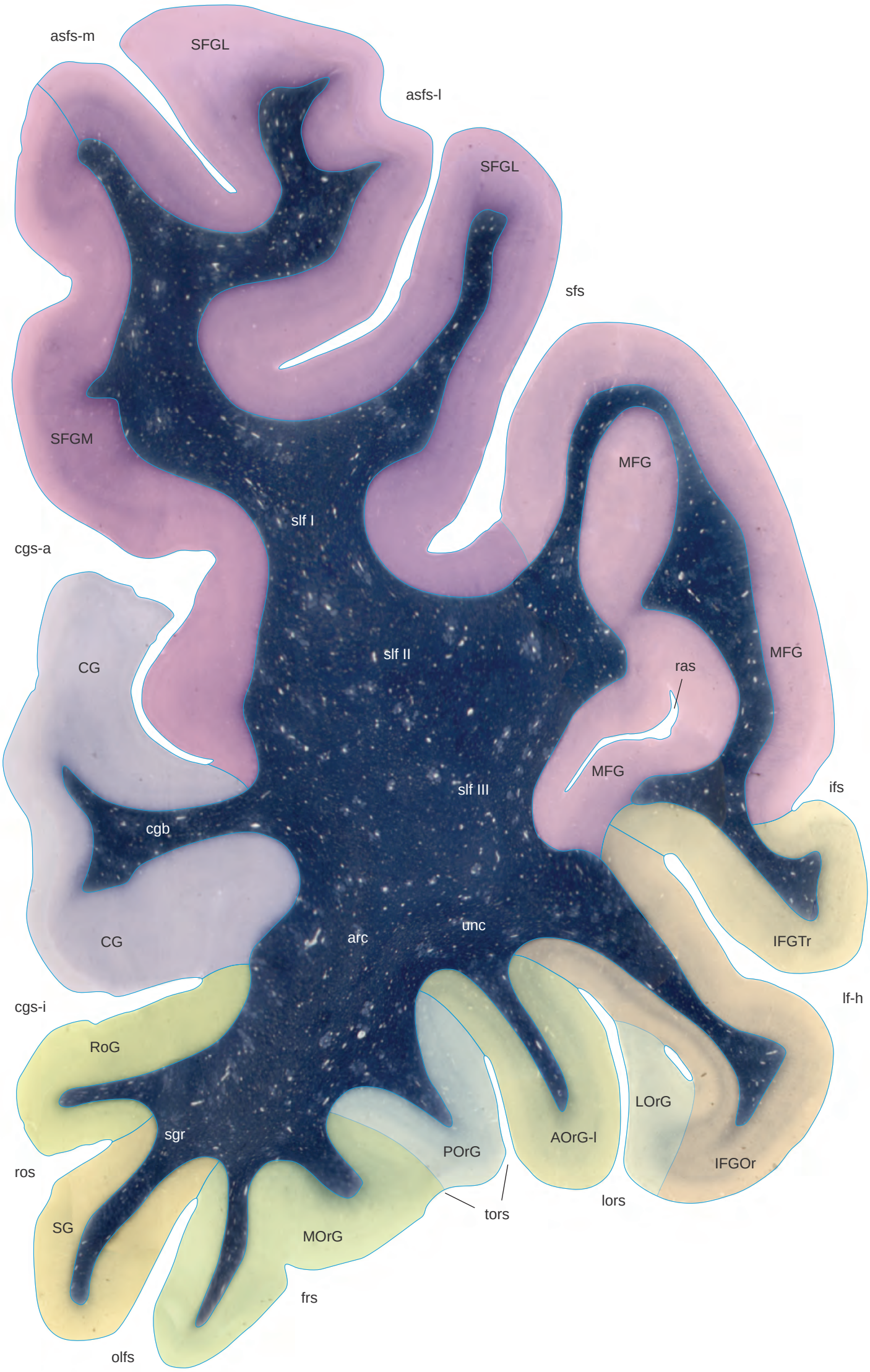
MNI: 40.93
ICL: -38.94
MCP: -53.68

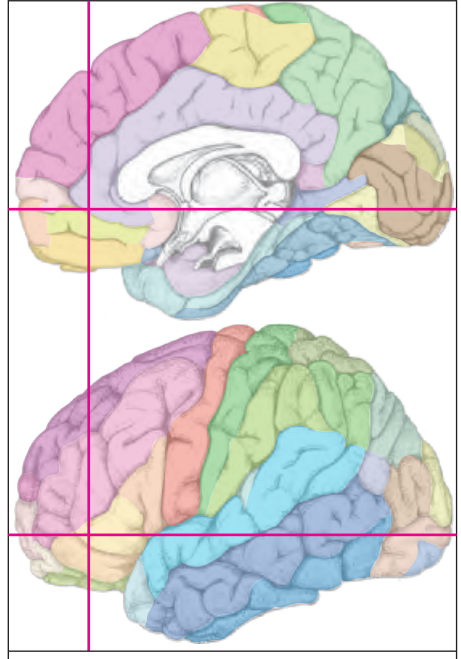


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA32,46 see p. 101

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
frs fragmentosus sulcus
ifs inferior frontal sulcus
lf-h lateral fissure, horizontal ramus
lors lateral orbital sulcus
olfs olfactory sulcus
OP 9,10,11,32,47 areas defined by Öngür et.al. (2003)
ros rostral sulcus
sfs superior frontal sulcus
tors transverse orbital sulcus

Cortex: Gyri and Sulci





MNI Position y = 39.44 mm
AHB Position y = -37.54 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Sulci

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
frs fragmentosus sulcus
ifs inferior frontal sulcus
lf-h horizontal ramus of lateral fissure
lors lateral orbital sulcus
olfs olfactory sulcus
ras radiate sulcus
ros rostral sulcus
sfs superior frontal sulcus
tors transverse orbital sulcus

Fibers

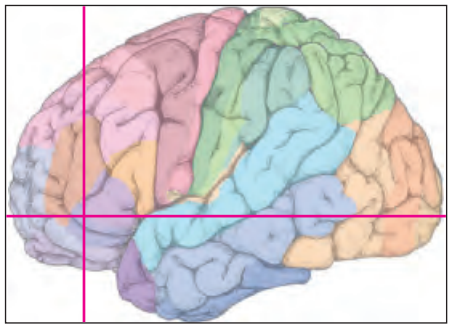
arc arcuate fascicle
cgb cingulum bundle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

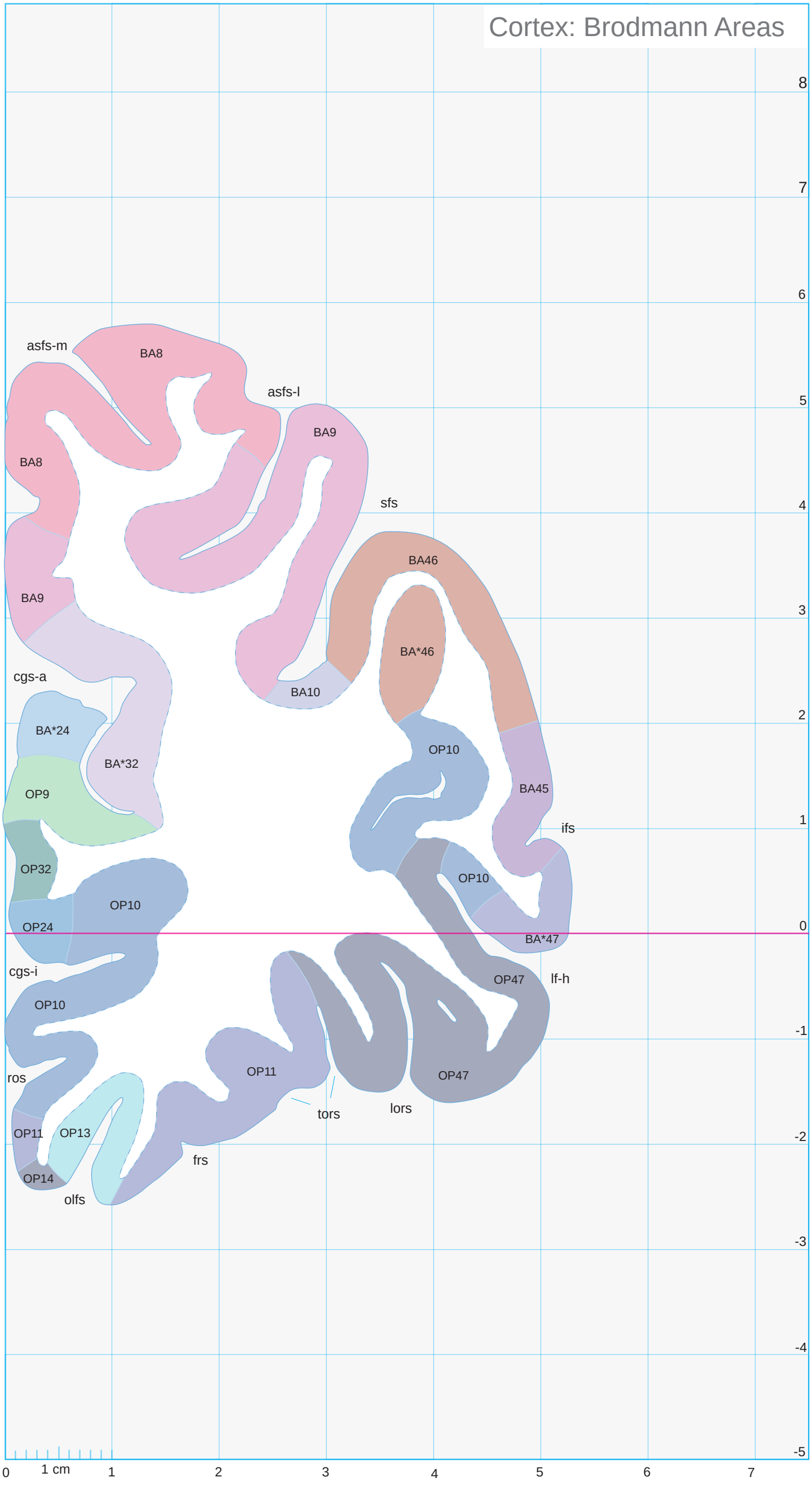
Fiber stain (Weigert)
Section Nr. 11
Slice Nr. 1089

Cortex: Brodmann Areas

11

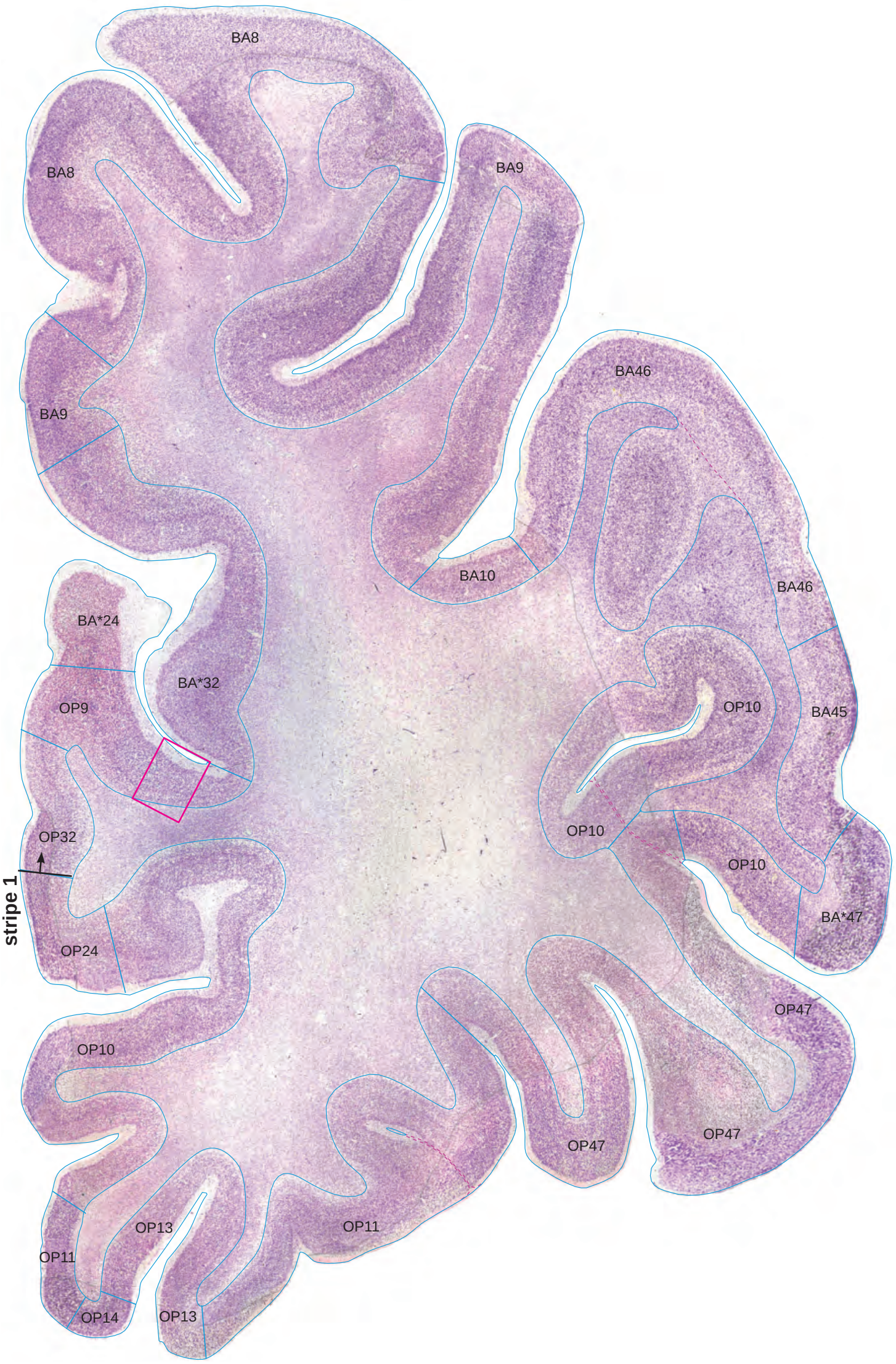
MNI: 39.44
ICL: -37.54
MCP: -52.28

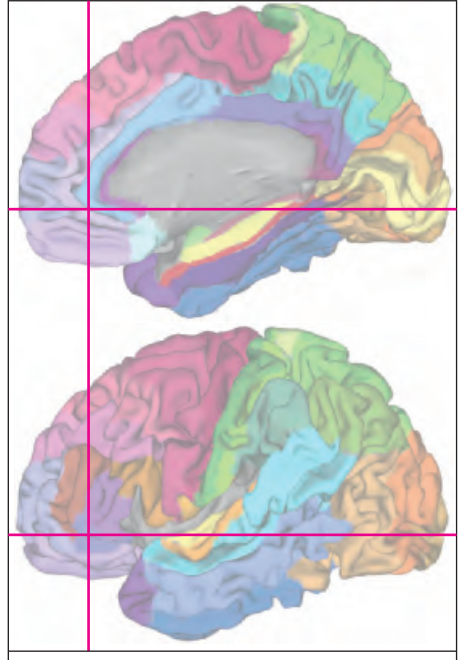




BA1-52 Brodmann areas 1-52 (see p. 101)
*BA24,32,46,47 see p. 101

asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
frs fragmentosus sulcus
ifs inferior frontal sulcus
lf-h lateral fissure, horizontal ramus
lors lateral orbital sulcus
olfs olfactory sulcus
OP 9,10,11,13,24,32,47 areas defined by Öngür et.al. (2003)
ros rostral sulcus
sfs superior frontal sulcus
tors transverse orbital sulcus





MNI Position y = 39.50 mm
AHB Position y = -37.60 mm

Gyral Pattern

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Brodmann Areas

BA8 area frontalis intermedia
BA9 area frontalis granularis
BA10 area frontopolaris
BA32 area cingularis anterior dorsalis
BA45 area triangularis
BA46 area frontalis media
BA47 area orbitalis
OP9 area 9 (by Öngür et al. 2003)
OP10 area 10 (by Öngür et al. 2003)
OP11 area 11 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP24 area 24 (by Öngür et al. 2003)
OP32 area 32 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

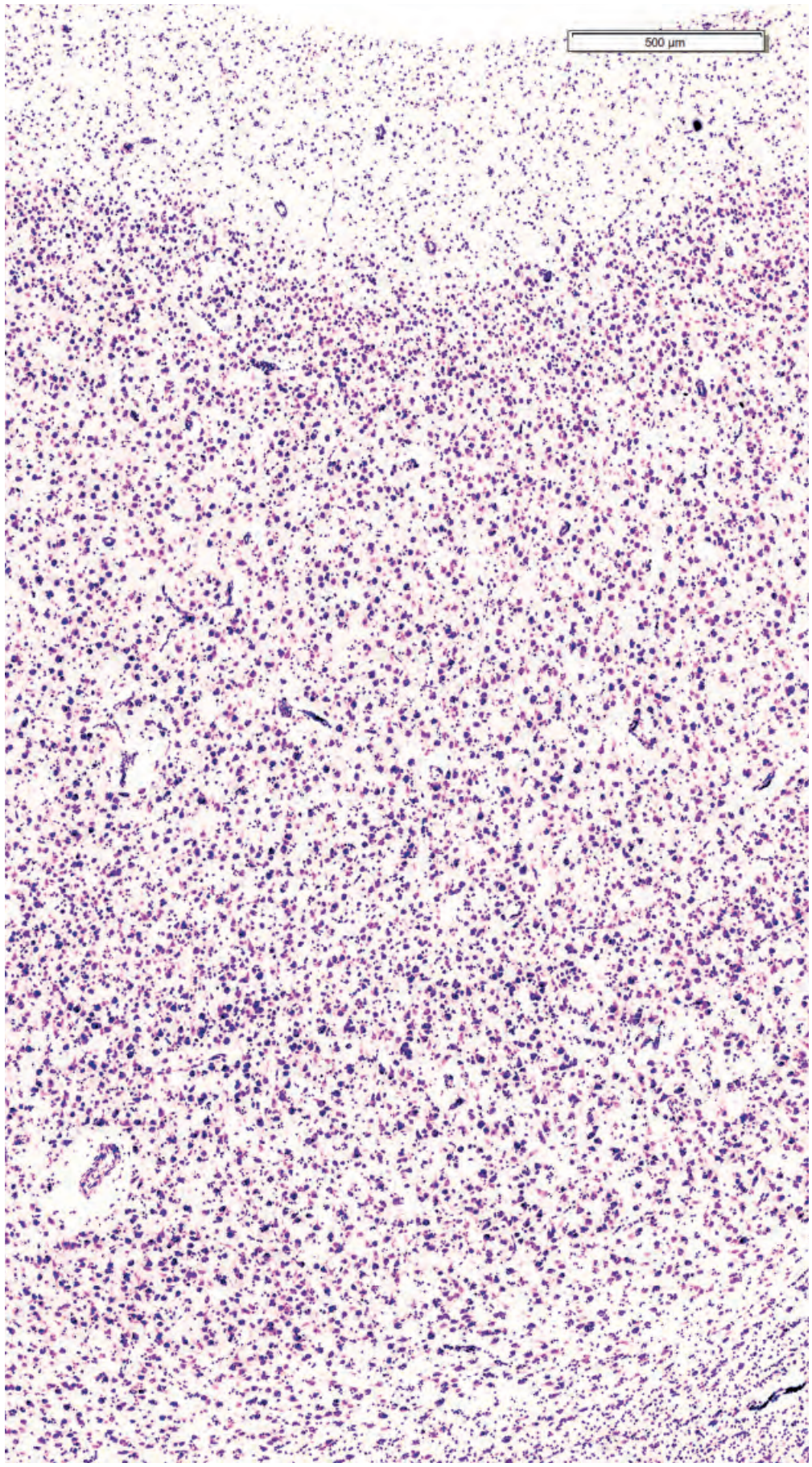
von Economo and Koskinas

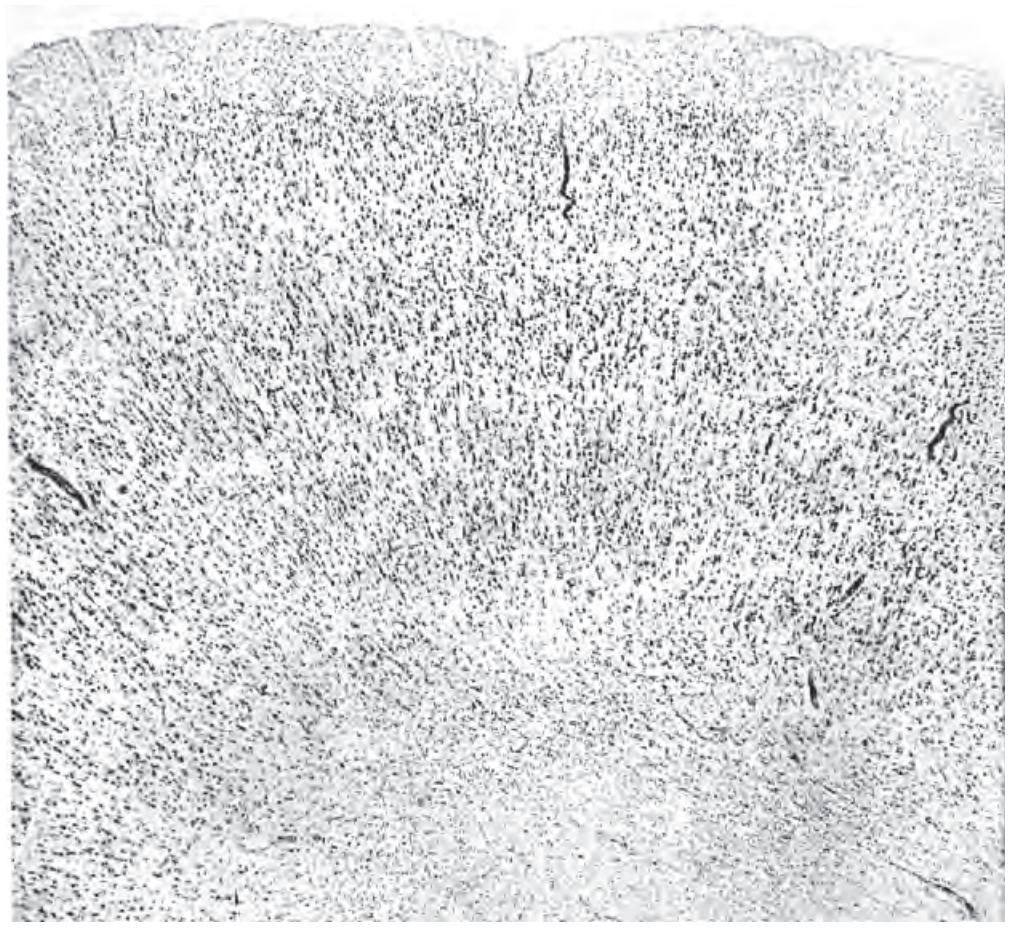
FB agranular frontal area
FC intermediate frontal area
FD granular frontal area
FDgamma+op triangular and opercular granular frontal area
FE frontopolar area
FEL limbic frontopolar area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FG area of straight gyrus (area recta)
FH prefrontal area
LA2 anterior cingulate agranular anterior limbic area

Regions of Interest

B. Vogt:
24c subregion of BA 24
33 frontal division of BA33
p24 posterior division of BA24
s32 subregion of area 24

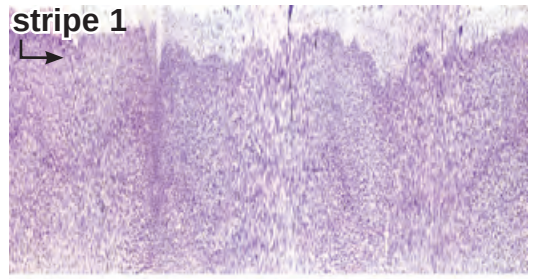
Cell stain (Nissl):
Section Nr. 11
Slice Nr. 1087



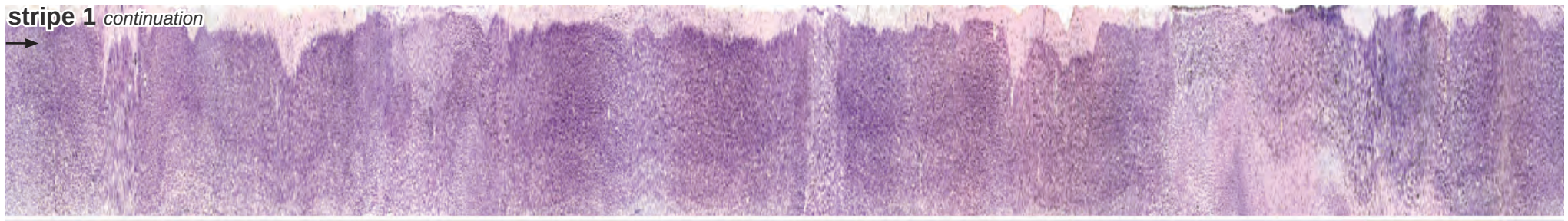


LA1 Area praecingularis. LA2 Area cingularis anterior.

von Economo and Koskinas (1925) Plate XLV (45)

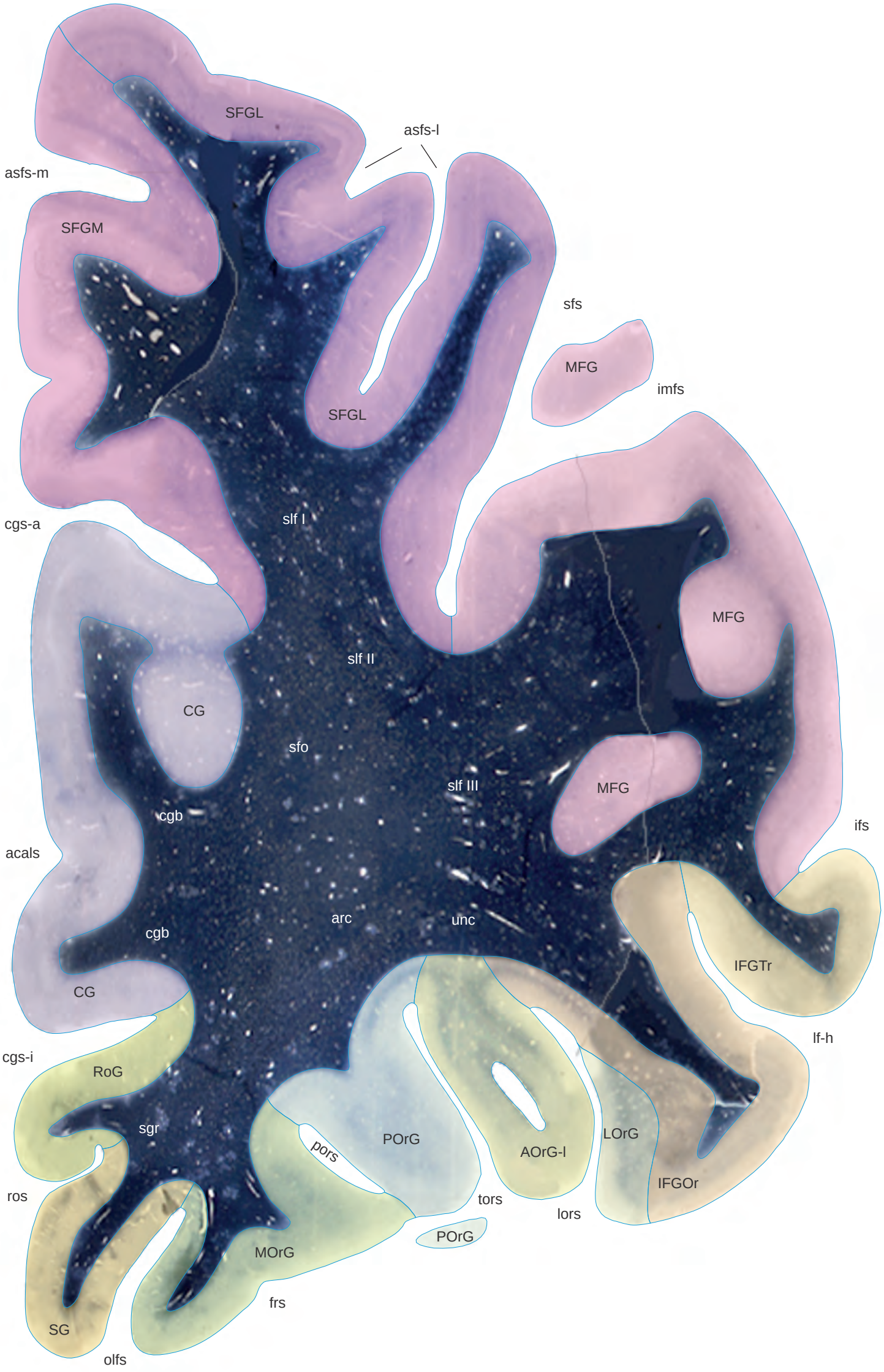


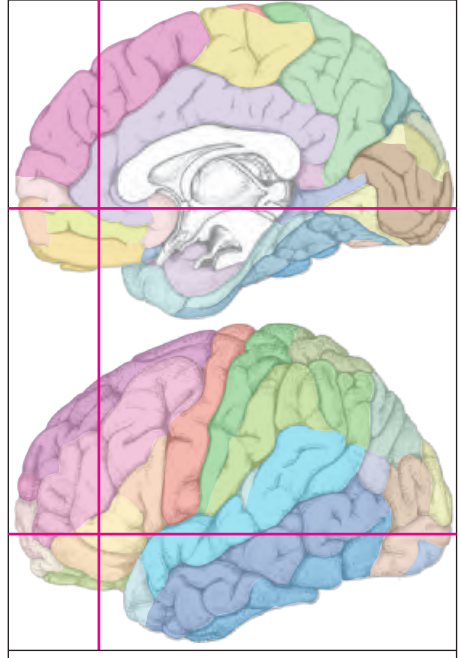
Gyral pattern	CG			SFGM
Brodmann areas	OP32	OP9		BA*32
von Economo	LA2		FE	FD
Regions of Interest	33	p24		24c



| | | | |

Cortex: Gyri and Sulci





MNI Position y = 35.30 mm
AHB Position y = -33.61 mm

Gyri

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Sulci

acals accessory callosal sulcus
asfs-l accessory superior frontal sulcus, lateral ramus
asfs-m accessory superior frontal sulcus, medial ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
frs fragmentosus sulcus
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf-h horizontal ramus of lateral fissure
lors lateral orbital sulcus
olfs olfactory sulcus
pors posterior orbital sulcus
ros rostral sulcus
sfs superior frontal sulcus
tors transverse orbital sulcus

Fibers

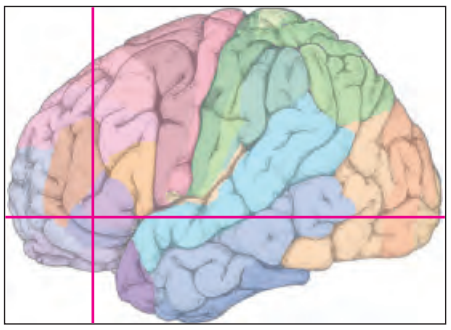
arc arcuate fascicle
cgb cingulum bundle
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 12
Slice Nr. 1236

Cortex: Brodmann Areas

12

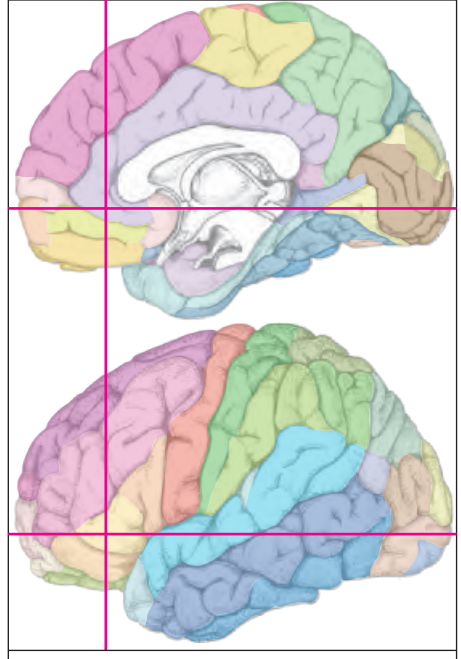
MNI: 35.30
ICL: -33.61
MCP: -48.35



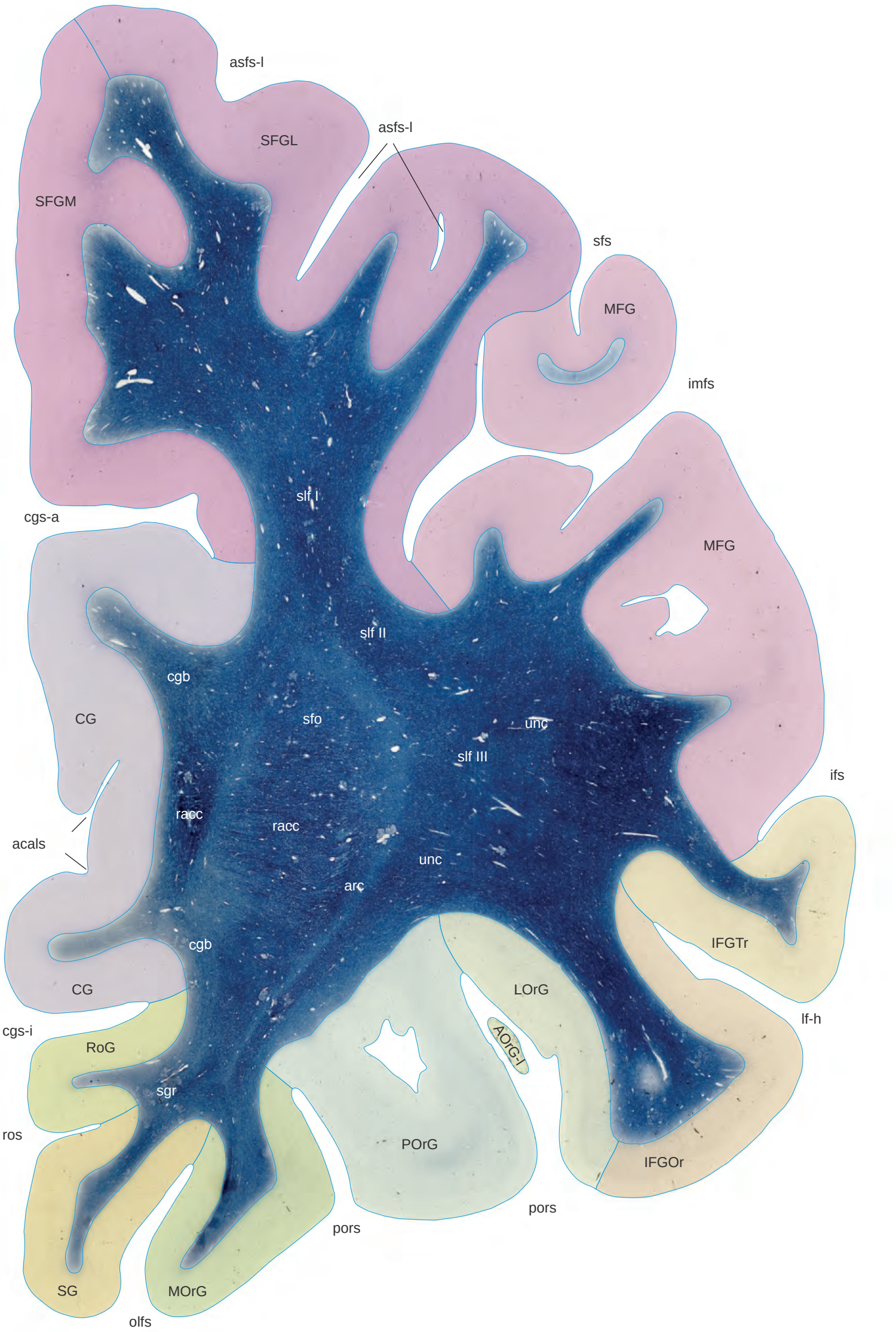
BA1-52 Brodmann areas 1-52 (see p. 101)
*BA24,47 see p. 101

acals accessory callosal sulcus
cgs-i inferior cingulate sulcus
OP10,11,13,14,24,47 areas defined by Öngür et.al. (2003)

Cortex: Gyri and Sulci



MNI Position y = 32.66 mm
AHB Position y = -30.93 mm



Gyri

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Sulci

acals accessory callosal sulcus
asfs-l accessory superior frontal sulcus, lateral ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf-h horizontal ramus of lateral fissure
olfs olfactory sulcus
pors posterior orbital sulcus
ros rostral sulcus
sfs superior frontal sulcus

Fibers

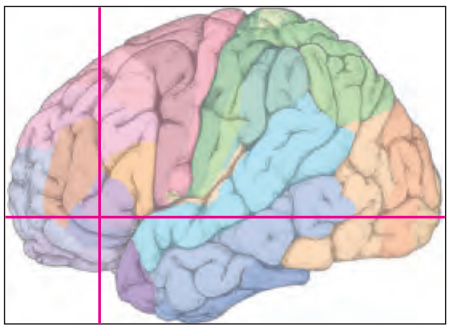
arc arcuate fascicle
cgb cingulum bundle
racc radiation of corpus callosum
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

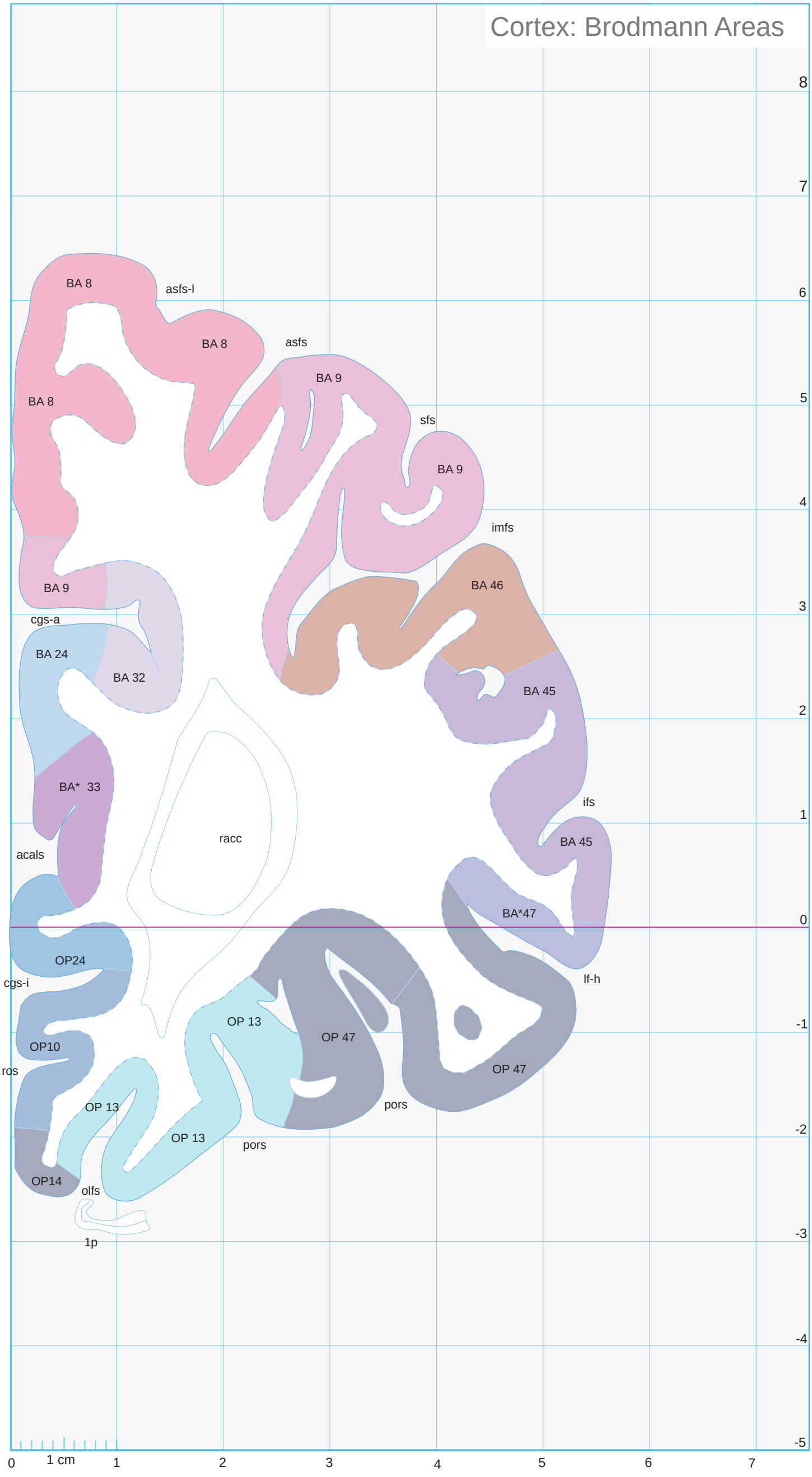
Fiber stain (Weigert)
Section Nr. 13
Slice Nr. 1336

Cortex: Brodmann Areas

13

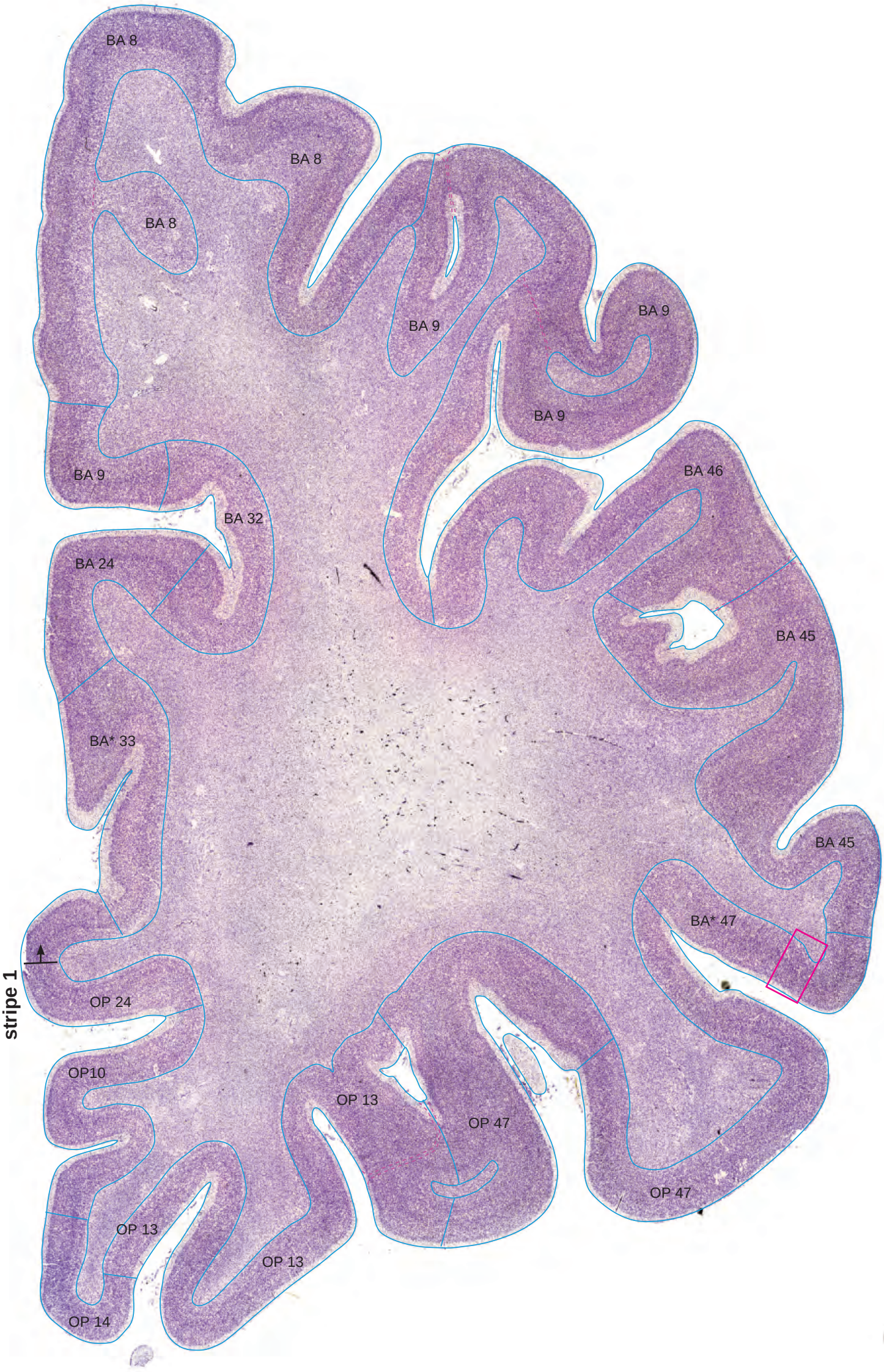
MNI: 32.66
ICL: -30.93
MCP: -45.67



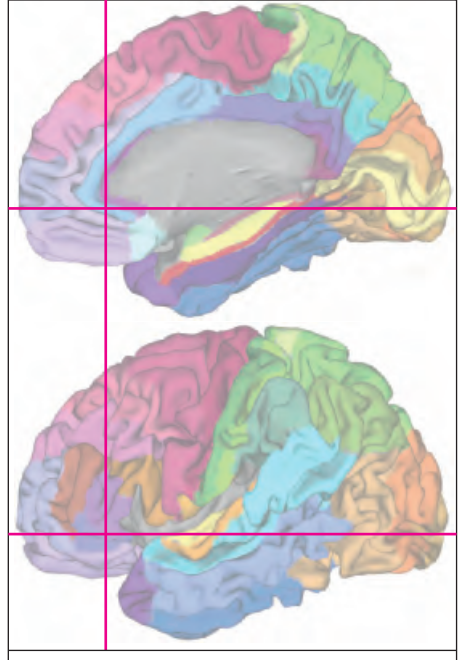


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA33,47 see p. 101

1p olfactory peduncle
acals accessory callosal sulcus
asfs accessory superior frontal sulcus
asfs-l accessory superior frontal sulcus, lateral ramus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf-h lateral fissure, horizontal ramus
olfs olfactory sulcus
OP10,13,14,24,47 areas defined by Öngür et.al. (2003)
pors posterior orbital sulcus
racc radiation of corpus callosum
ros rostral sulcus
sfs superior frontal sulcus



stripe 1



MNI Position y = 32.52 mm
AHB Position y = -30.95 mm

Gyral Pattern

AOrG-l anterior orbital gyrus, lateral part
CG cingulate gyrus
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus

Brodmann Areas

BA8 area frontalis intermedia
BA9 area frontalis granularis
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA45 area triangularis
BA46 area frontalis media
BA47 area orbitalis
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP24 area 24 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

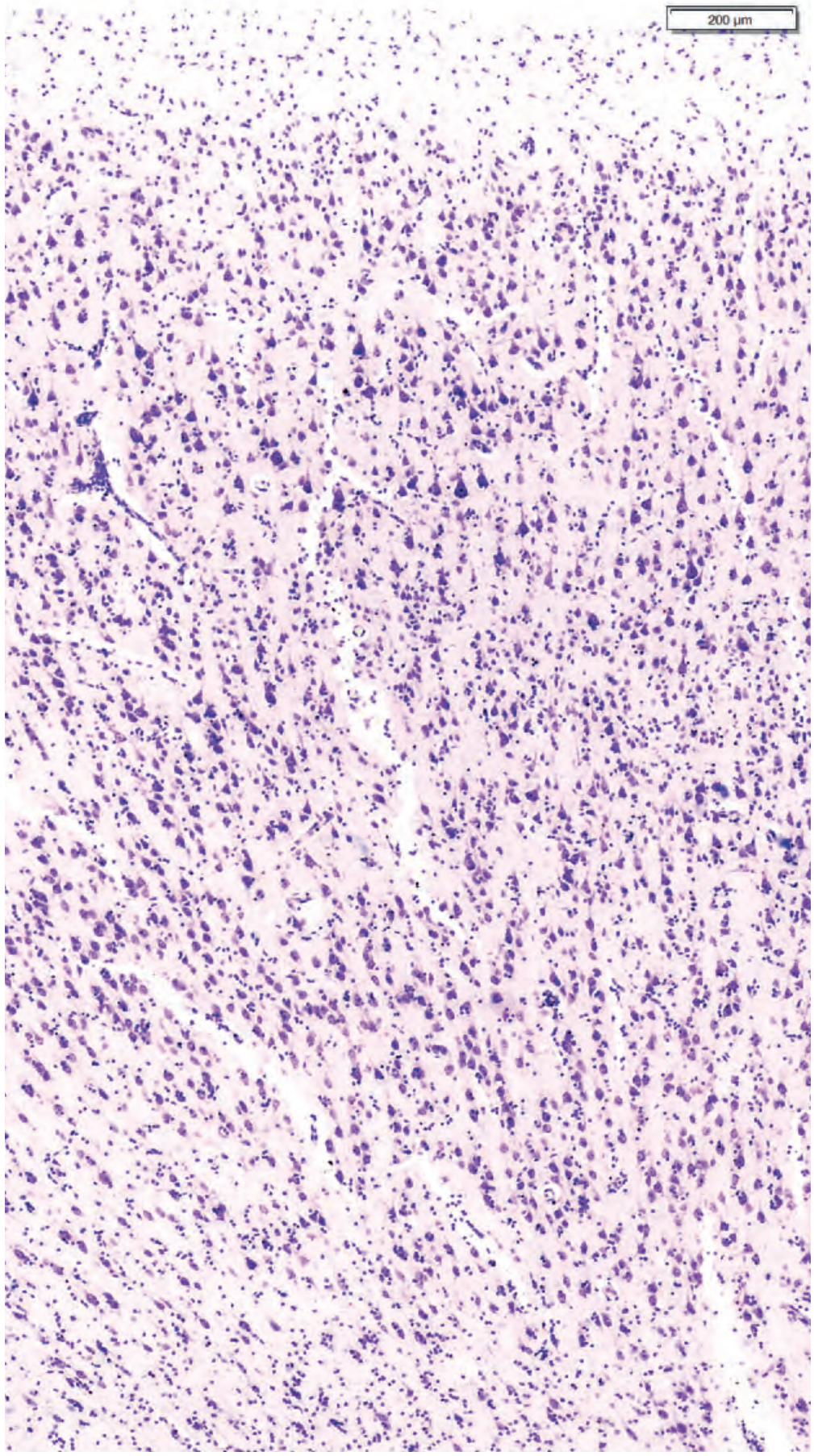
von Economo and Koskinas

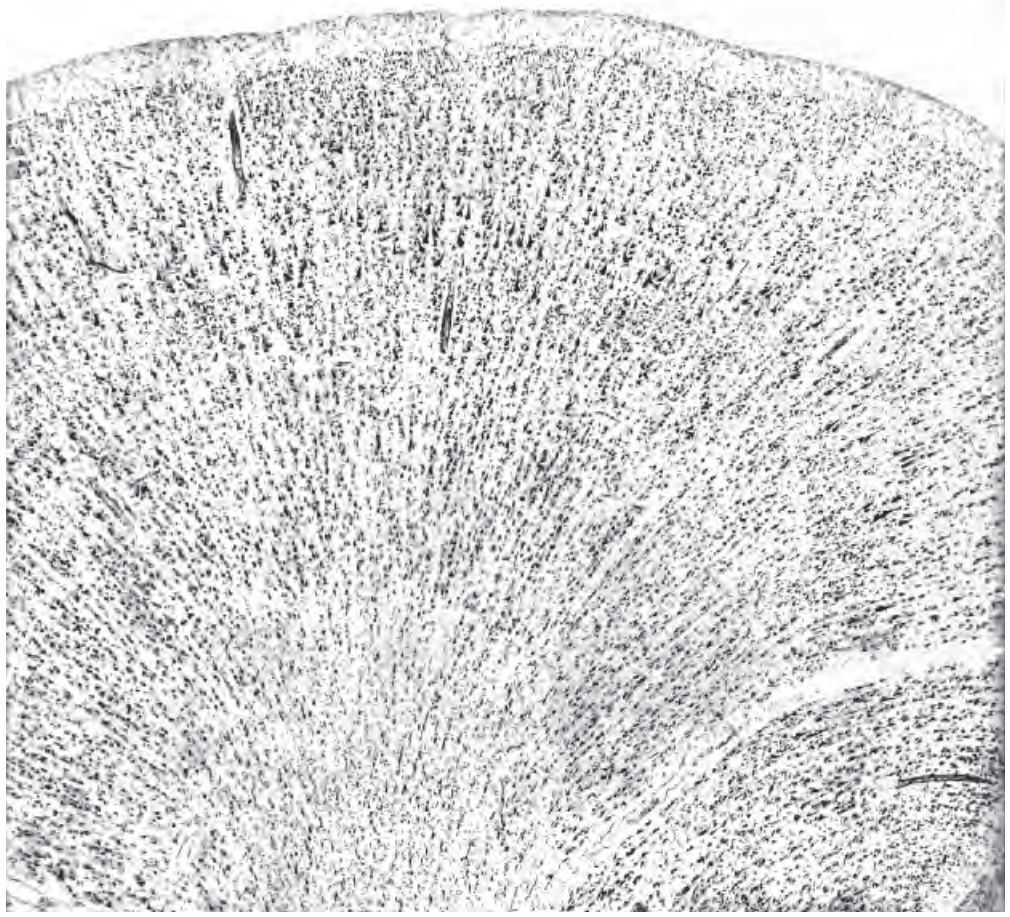
FC intermediate frontal area
FD granular frontal area
FDgamma+op triangular and opercular granular frontal area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FG area of straight gyrus (area recta)
FH prefrontal area
FHL parolfactory prefrontal area
LA2 anterior cingulate agranular anterior limbic area

Regions of Interest

B. Vogt:
24c subregion of BA 24
32 frontal division of BA32
33 frontal division of BA33
p24 posterior division of BA24
s24 superior division of BA24

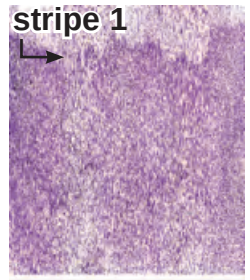
Cell stain (Nissl):
Section Nr. 13
Slice Nr. 1335



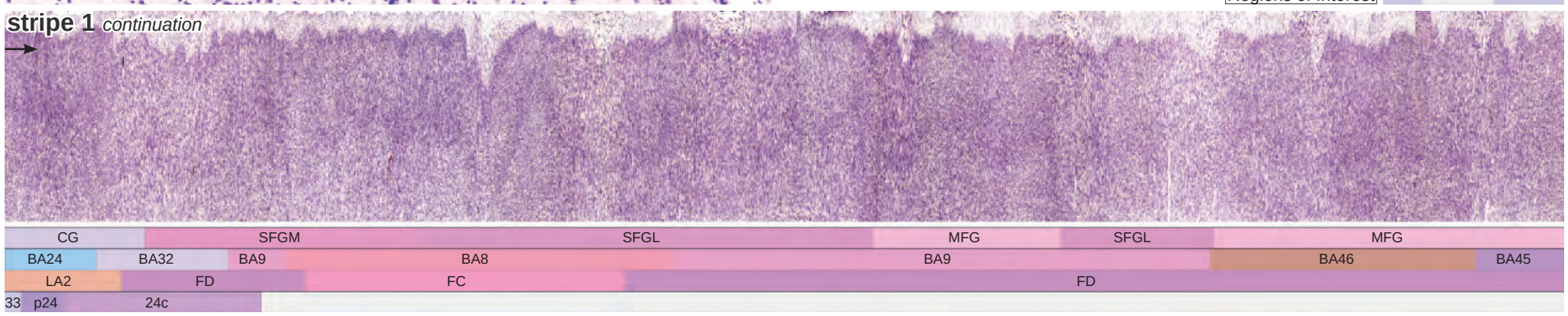


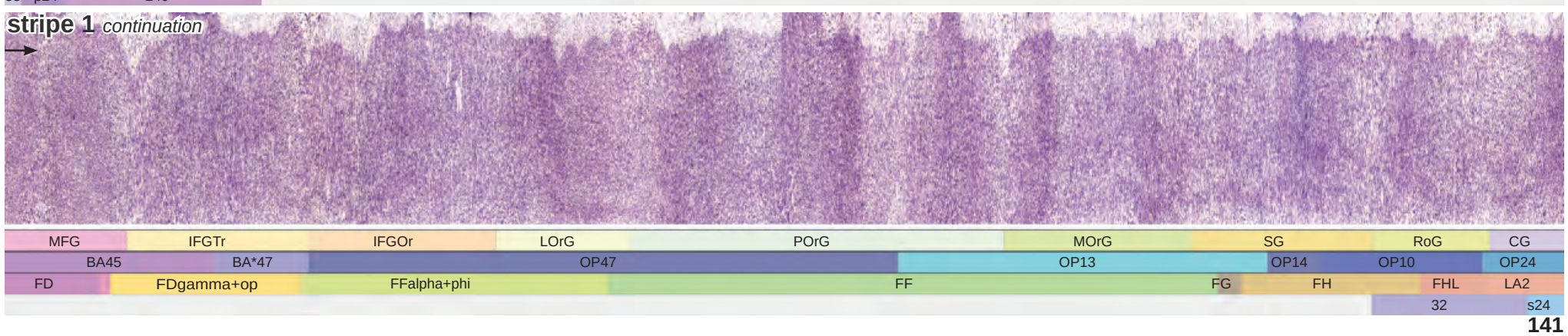
FDΓ Area frontalis granularis triangularis.

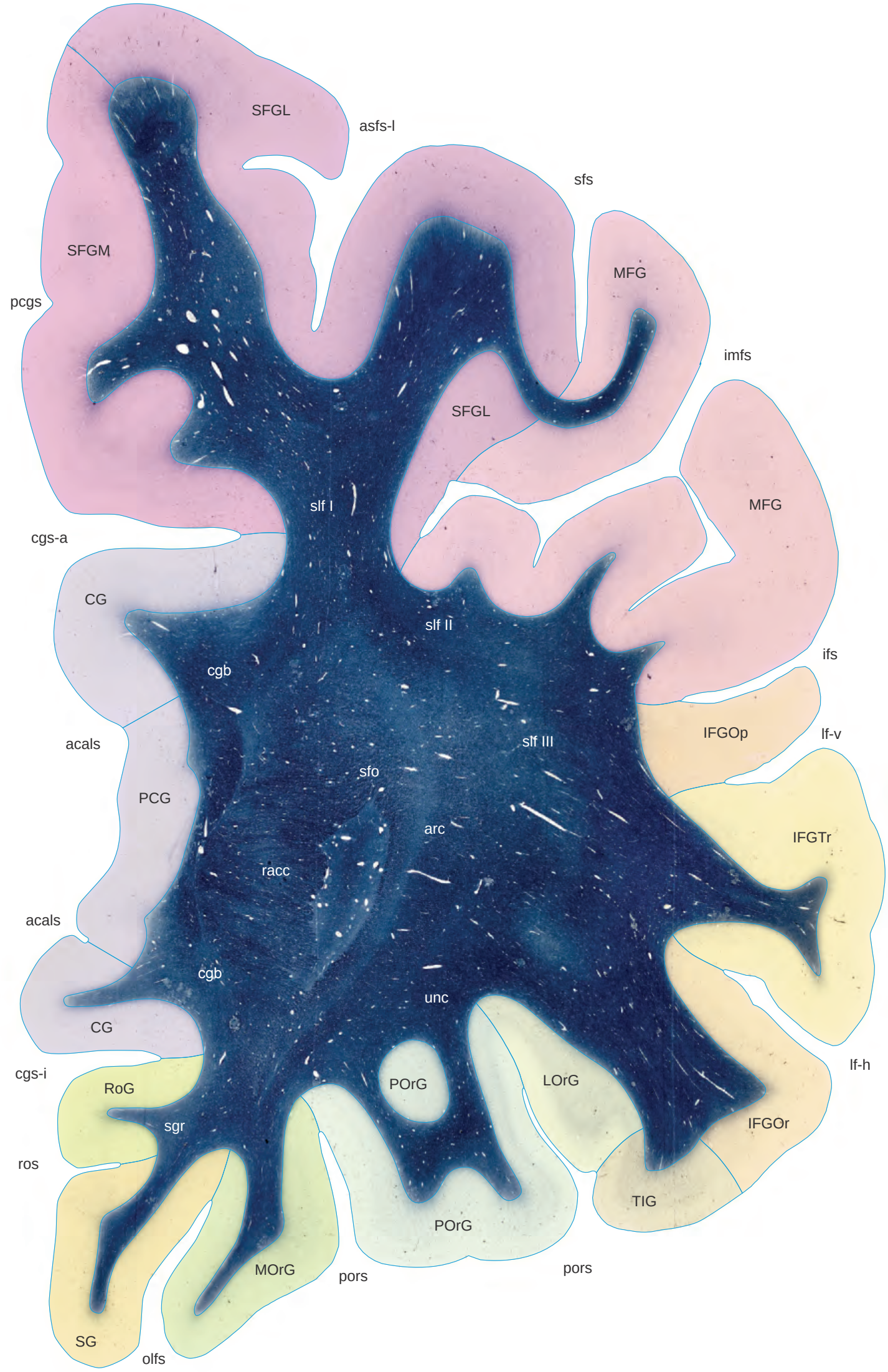
von Economo and Koskinas (1925) Plate XXIX (29)

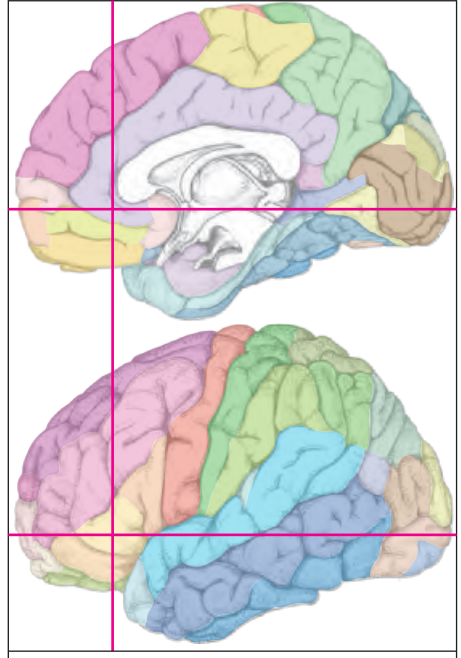


Gyral pattern	CG		
Brodmann areas	OP24	BA*33	
von Economo	LA2		
Regions of Interest	33		33




stripe 1 continuation
MFG IFGTr IFGOr LOrG POrG MOrG SG RoG CG
BA45 BA*47 OP47 OP13 OP14 OP10 OP24
FD FDgamma+op FFalpha+phi FF FG FH FHL LA2
32 s24





MNI Position y = 29.73 mm
AHB Position y = -28.30 mm

Gyri

CG cingulate gyrus
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus

Sulci

acals accessory callosal sulcus
asfs-l accessory superior frontal sulcus, lateral ramus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf-h horizontal ramus of lateral fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
pcgs paracingulate sulcus
pors posterior orbital sulcus
ros rostral sulcus
sfs superior frontal sulcus

Fibers

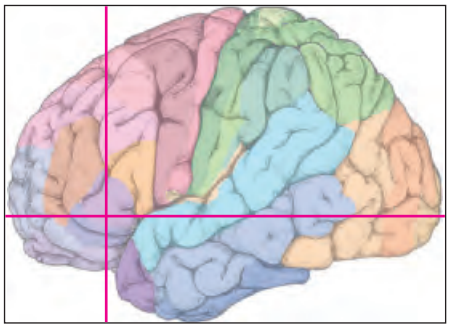
arc arcuate fascicle
cgb cingulum bundle
racc radiation of corpus callosum
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 14
Slice Nr. 1434

Cortex: Brodmann Areas

14

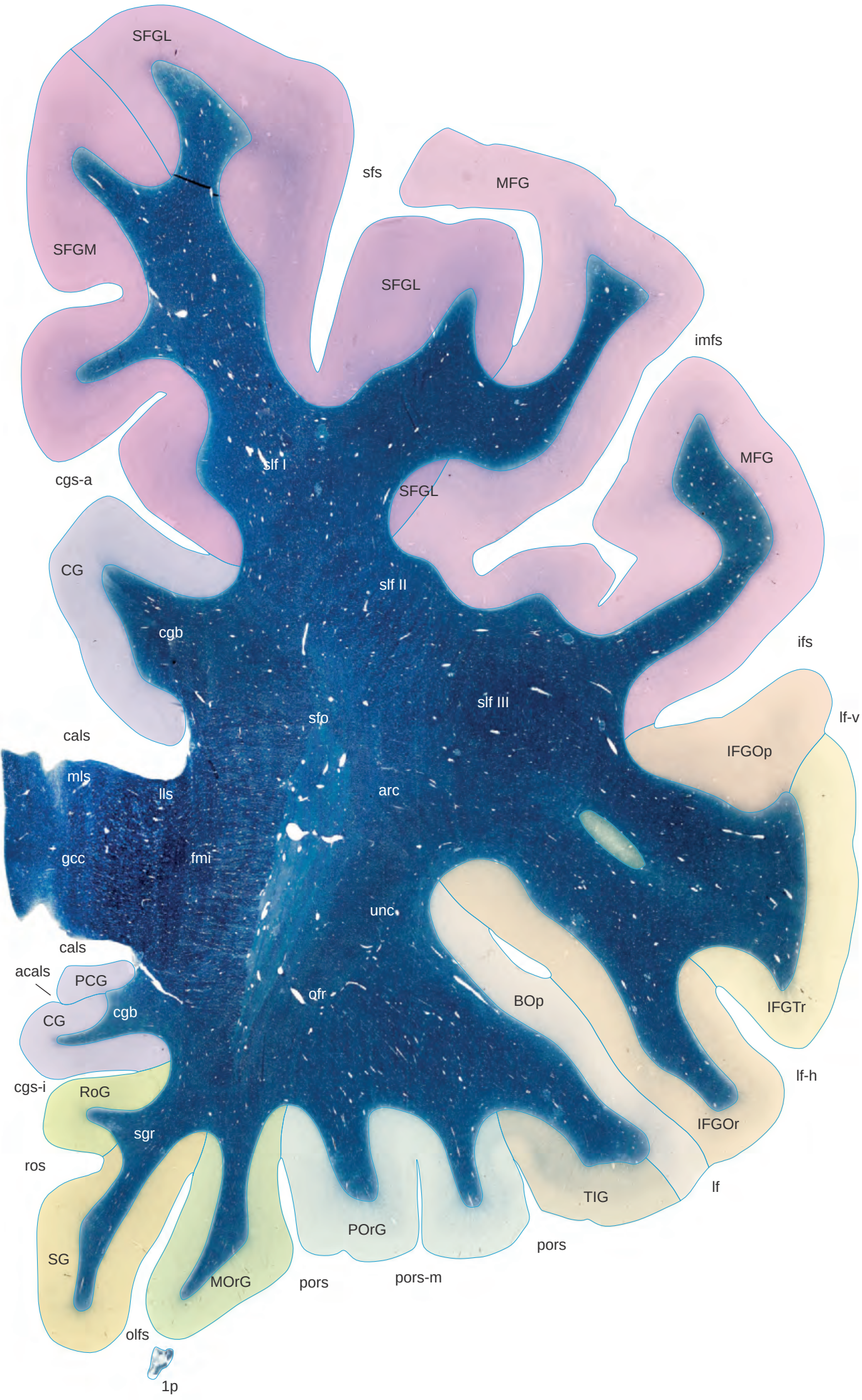
MNI: 29.73
ICL: -28.30
MCP: -43.04

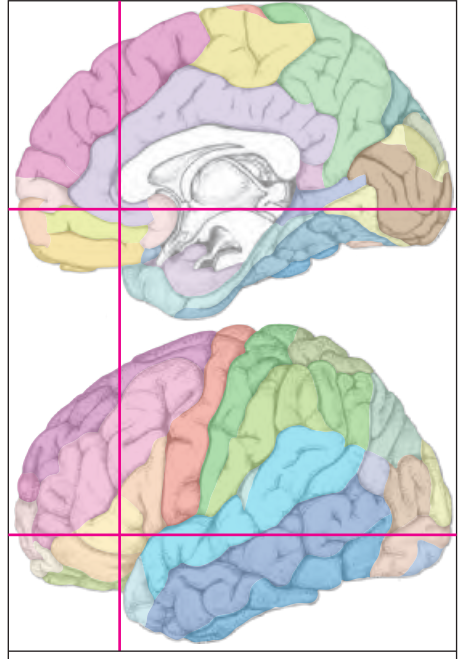


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA33,47 see p. 101

1p olfactory peduncle
asfs-l accessory superior frontal sulcus, lateral ramus
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
fmi forceps minor of corpus callosum
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf-h lateral fissure, horizontal ramus
lf-v vertical ramus of lateral fissure
lors lateral orbital sulcus
OP10,13,14,24,47 areas defined by Öngür et.al. (2003)
pors posterior orbital sulcus
racc radiation of corpus callosum
ros rostral sulcus
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa

Cortex: Gyri and Sulci





MNI Position y = 26.88 mm
AHB Position y = -25.59 mm

Gyri

CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus

Sulci

acals accessory callosal sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf lateral fissure
lf-h horizontal ramus of lateral fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
pors posterior orbital sulcus
pors-m middle transverse olfactory sulcus
ros rostral sulcus
sfs superior frontal sulcus

Fibers

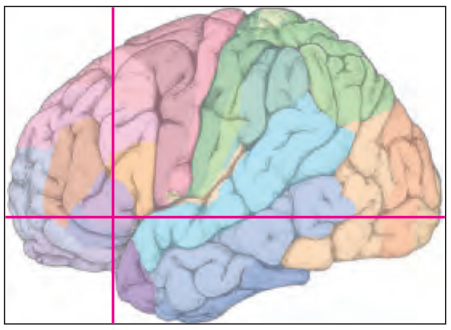
1p olfactory peduncle
arc arcuate fascicle
cgb cingulum bundle
fmi forceps minor of the corpus callosum
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 15
Slice Nr. 1535

Cortex: Brodmann Areas

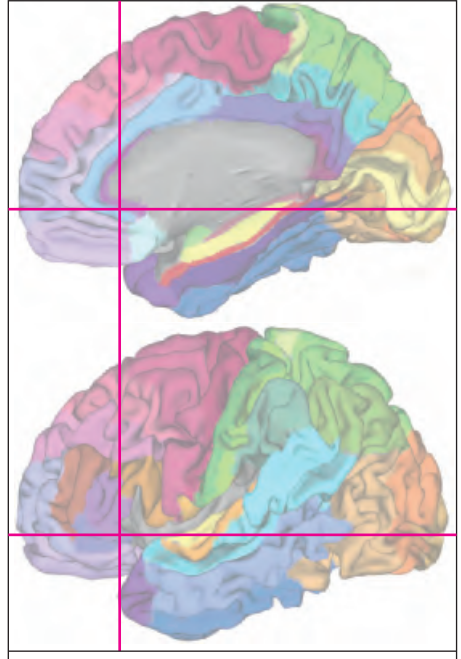
15

MNI: 26.88
ICL: -25.59
MCP: -40.33



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA45 see p. 101

1p olfactory peduncle
cals callosal sulcus
calv callosal vein
cgs-a cingulate sulcus, anterior p.
fmi forceps minor of corpus callosum
gcc genu of corpus callosum
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf lateral (Sylvian) fissure
lf-h lateral fissure, horizontal ramus
olfs olfactory sulcus
OP10,13,14,24,47 areas defined by Öngür et.al. (2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
pors-m posterior orbital sulcus, middle branch
racc radiation of corpus callosum
ros rostral sulcus
SCS subcallosal stratum
sfs superior frontal sulcus
SGI substantia gliosa



MNI Position y = 26.86 mm
AHB Position y = -25.57 mm

Gyral Pattern

CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
BA45 area triangularis
BA46 area frontalis media
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP24 area 24 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
OP_PRCO precentral opercular area (by Öngür et al. 2003)
TPCm medial temporopolar cortex
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

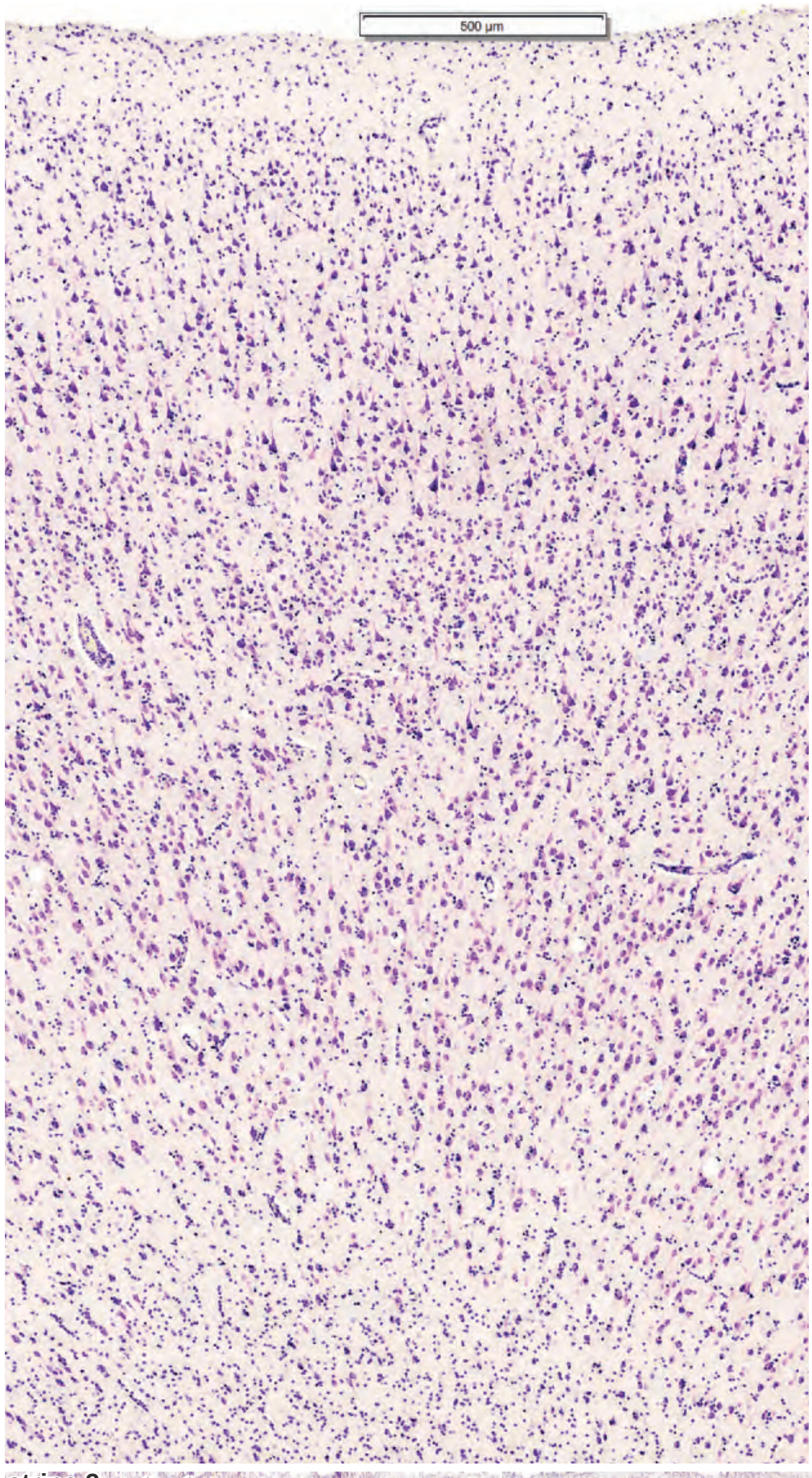
von Economo and Koskinas

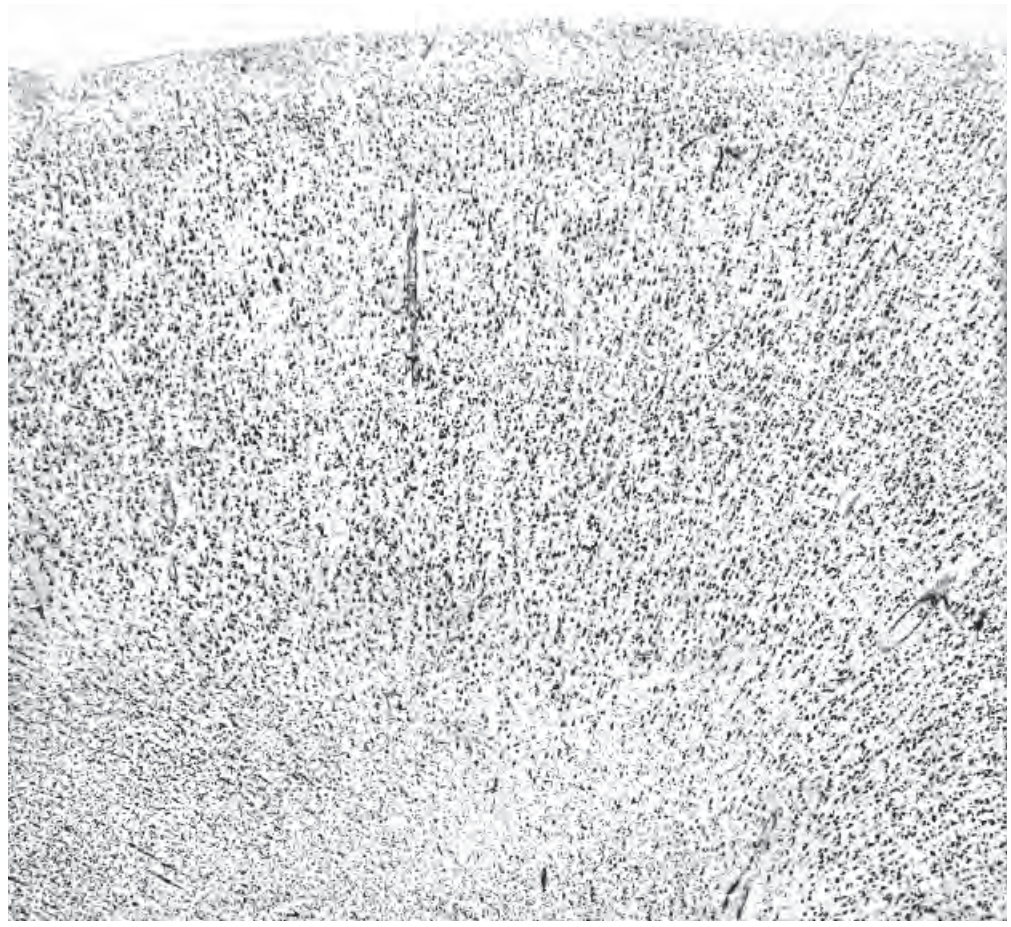
FB agranular frontal area
FB agranular frontal area
FC intermediate frontal area
FD granular frontal area
FDgamma+op triangular and opercular granular frontal area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FH prefrontal area
FHL parolfactory prefrontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TG temporo polar area

Regions of Interest

B. Vogt:
24c subregion of BA 24
32 frontal division of BA32
33 frontal division of BA33
a24c' anterior division of BA24
p24 posterior division of BA24
s24 superior division of BA24

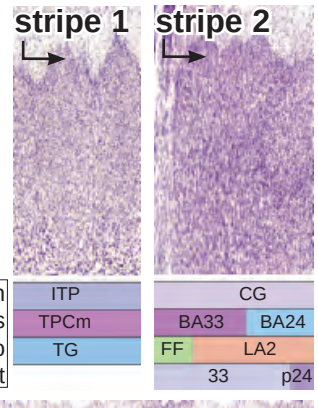
Cell stain (Nissl):
Section Nr. 15
Slice Nr. 1536

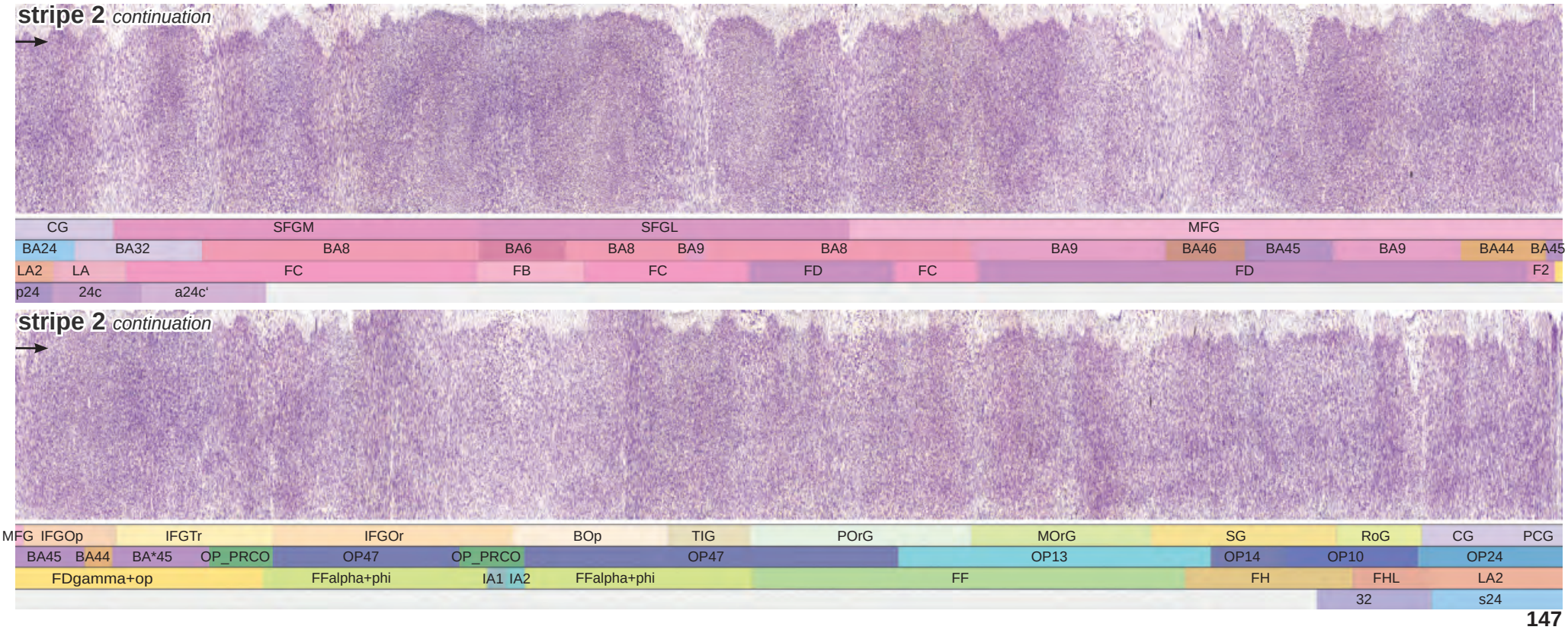




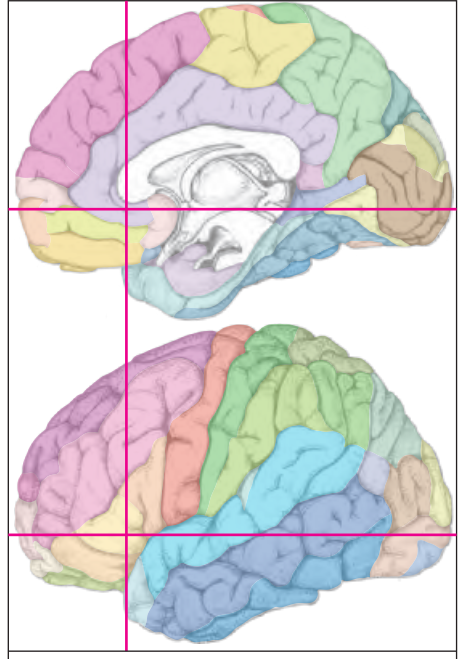
FFa Area orbitalis (posterior prope-) agranularis.

von Economo and Koskinas (1925) Plate XXXIII (33)

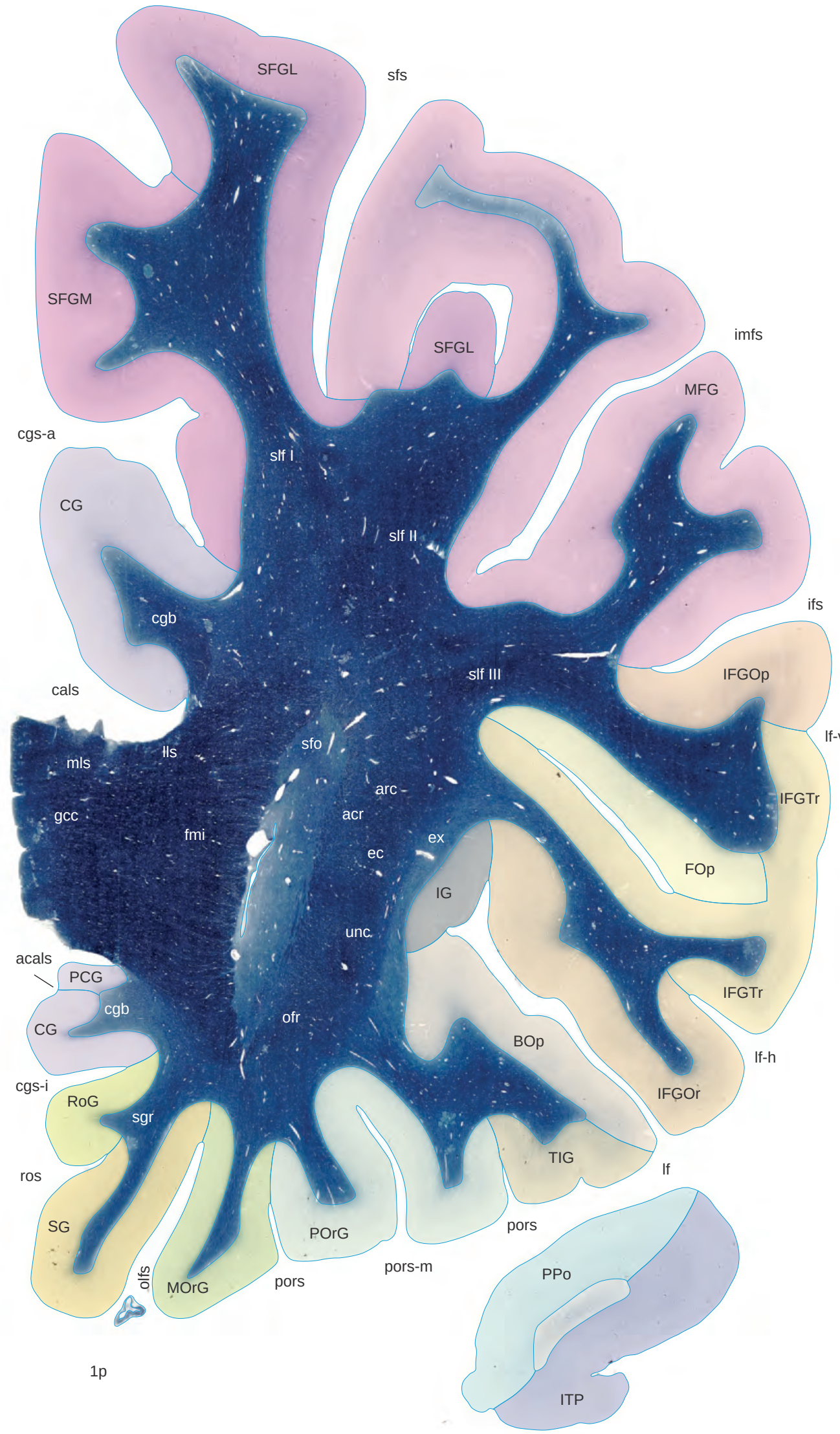




Cortex: Gyri and Sulci



MNI Position y = 24.07 mm
AHB Position y = -22.97 mm



Fiber stain (Weigert)
Section Nr. 16
Slice Nr. 1633

Gyri

CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus

Sulci

acals accessory callosal sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
ifs inferior frontal sulcus
imfs intermediate frontal sulcus
lf lateral fissure
lf-h horizontal ramus of lateral fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
pors posterior orbital sulcus
pors-m middle transverse olfactory sulcus
ros rostral sulcus
sfs superior frontal sulcus

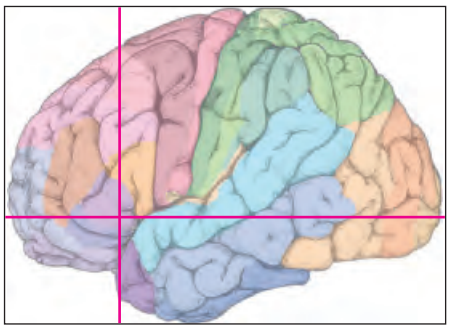
Fibers

1p olfactory peduncle
acr anterior corona radiata
arc arcuate fascicle
cgb cingulum bundle
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

16

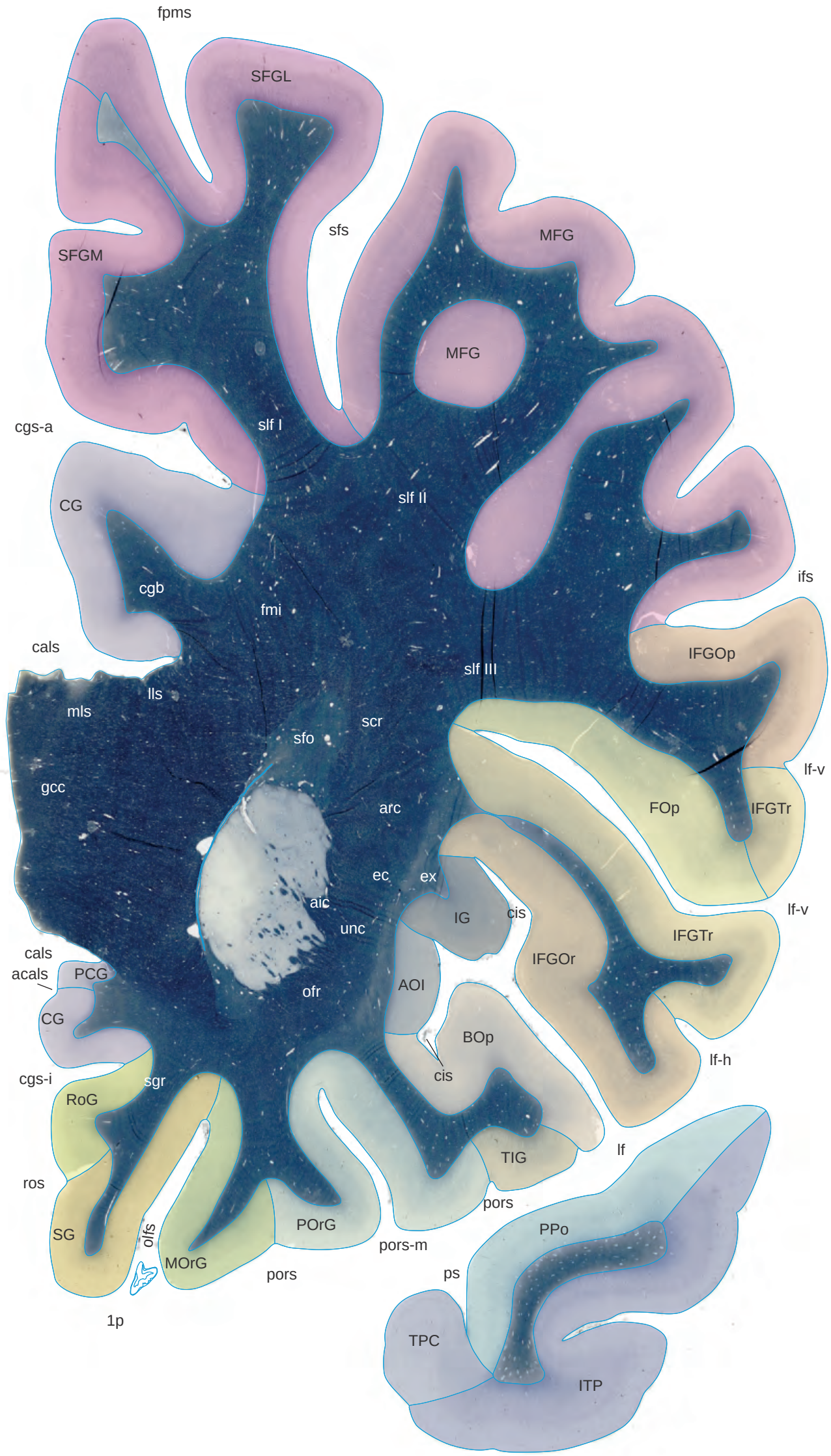
MNI: 24.07
ICL: -22.97
MCP: -37.71

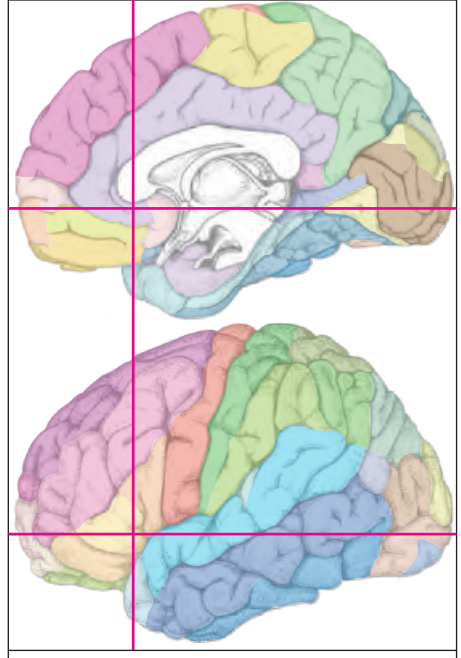


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA45 see p. 101

1p olfactory peduncle
cals callosal sulcus
calv callosal vein
Cd caudate n.
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
FLV frontal horn of lat. ventricle
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
imfs intermediate frontal sulcus
lf lateral (Sylvian) fissure
olfs olfactory sulcus
OP10,13,14,24,47 areas defined by Öngür et.al. (2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
pors-m posterior orbital sulcus, middle branch
racc radiation of corpus callosum
SCG cingulate gyrus
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex

Cortex: Gyri and Sulci





MNI Position y = 21.28 mm
AHB Position y = -20.34 mm

Gyri

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus
TPC tempopolar cotex

Sulci

acals accessory callosal sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
cis circular sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus
lf lateral fissure
lf-h horizontal ramus of lateral fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
pors posterior orbital sulcus
pors-m middle transverse olfactory sulcus
ps polar sulcus
ros rostral sulcus
sfs superior frontal sulcus

Fibers

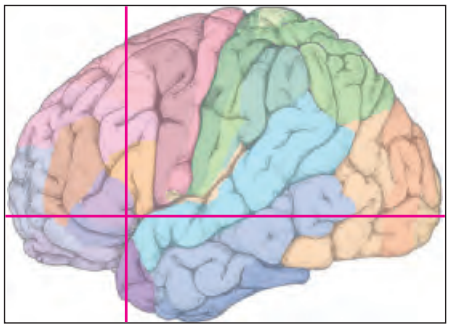
1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
cgb cingulum bundle
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 17
Slice Nr. 1731

Cortex: Brodmann Areas

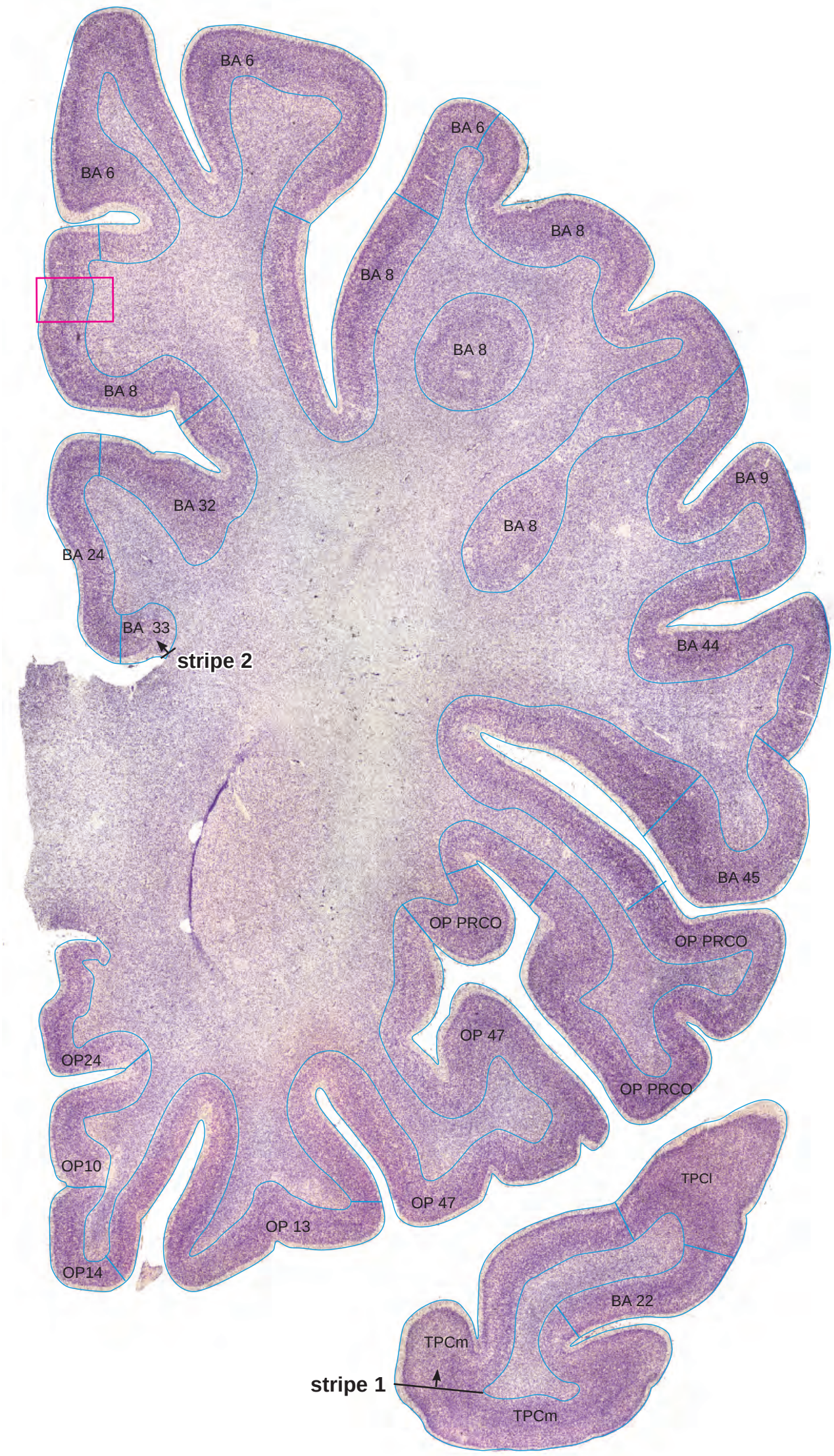
17

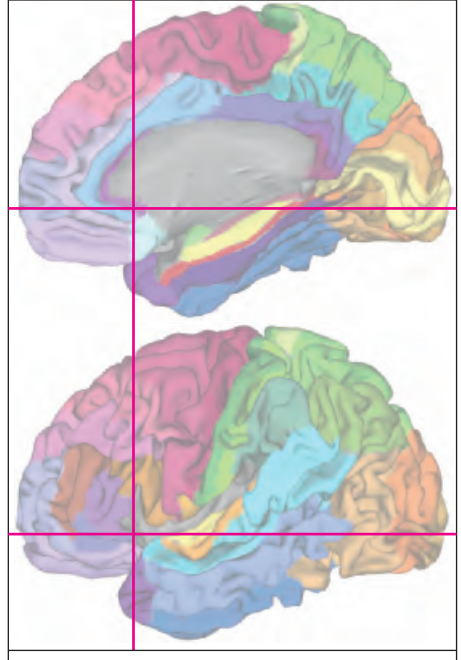
MNI: 21.28
ICL: -20.34
MCP: -35.08



BA1-52 Brodmann areas 1-52 (see p. 101)

1p olfactory peduncle
AO anterior olfactory n. (retrobulbar region)
cals callosal sulcus
calv callosal vein
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
Cl claustrum
ex extreme capsule
fpms frontal paramidline sulcus
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
lf-h lateral fissure, horizontal ramus
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
OP10,13,14,24,47 areas defined by Öngür et.al. (2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
pors-m posterior orbital sulcus, middle branch
Pu putamen
racc radiation of corpus callosum
ros rostral sulcus
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sts superior temporal sulcus
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex





MNI Position y = 21.26 mm
AHB Position y = -20.23 mm

Gyral Pattern

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus
TPC tempopolar cotex

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
BA45 area triangularis
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP24 area 24 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
OP_PRCO precentral opercular area (by Öngür et al. 2003)
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex

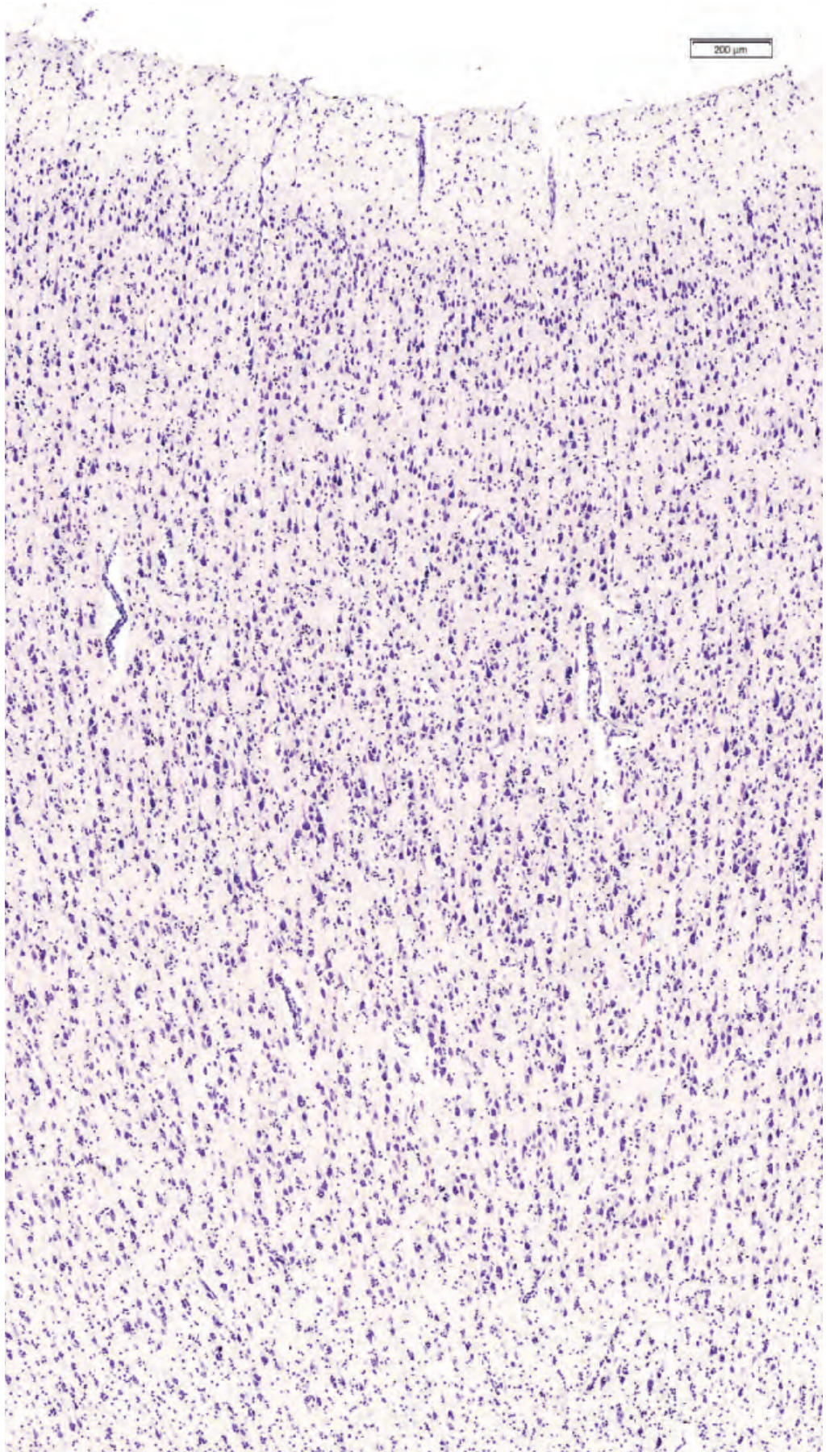
von Economo and Koskinas

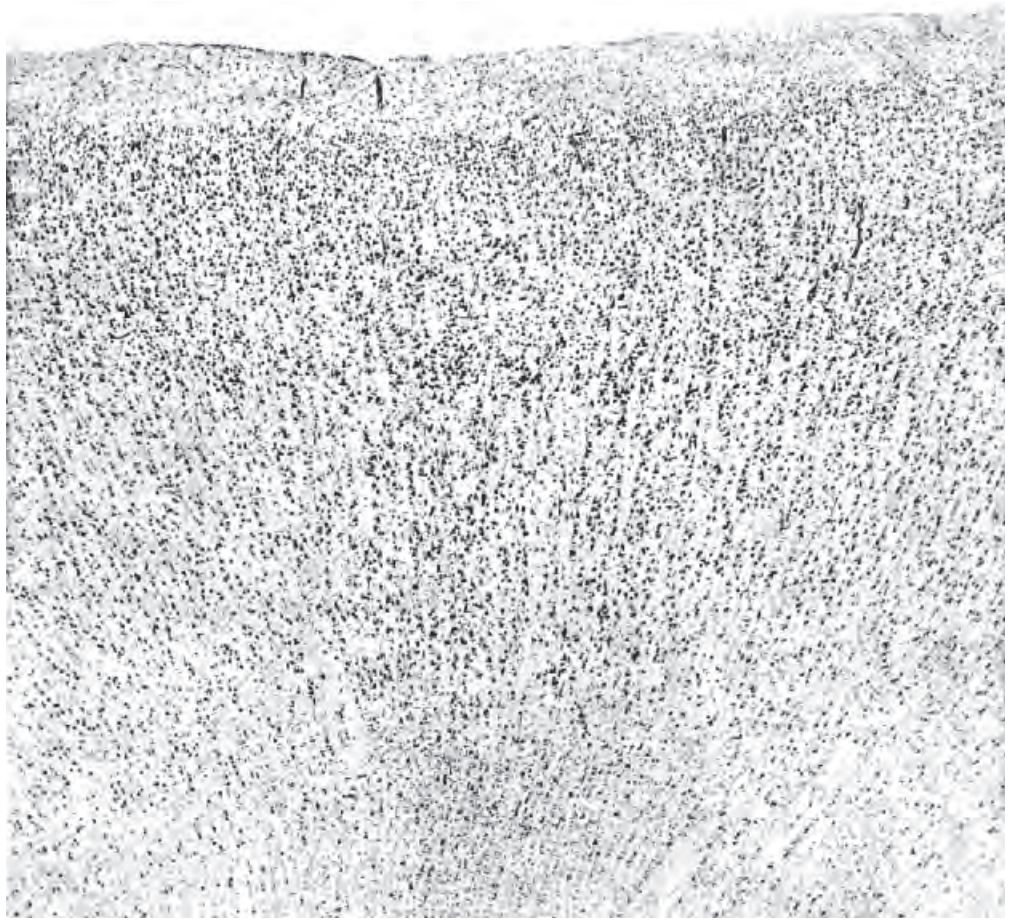
FB agranular frontal area
FB agranular frontal area
FC intermediate frontal area
FD granular frontal area
FDgamma+op triangular and opercular granular frontal area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FH prefrontal area
FHL parolfactory prefrontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TG temporo polar area

Regions of Interest

B. Vogt:
25 BA25
33 frontal division of BA33
a24c‘ anterior division of BA24
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24 posterior division of BA24

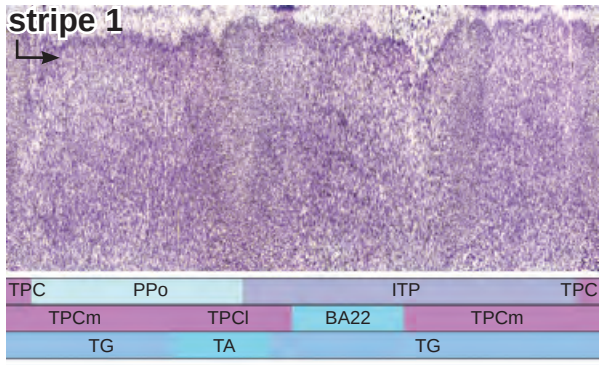
Cell stain (Nissl):
Section Nr. 17
Slice Nr. 1735

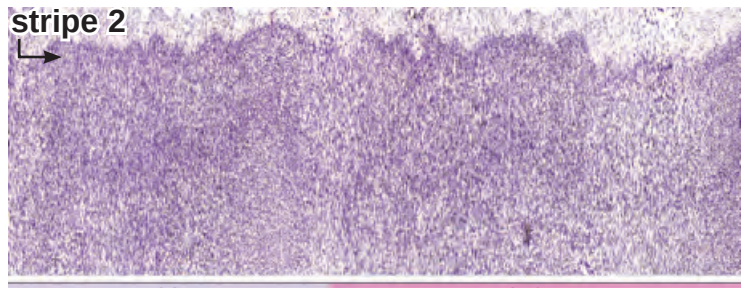


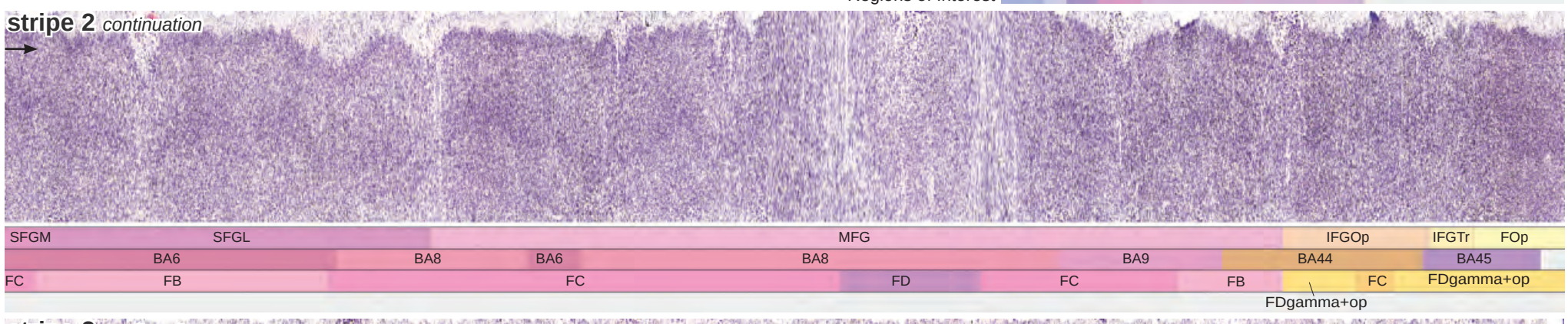


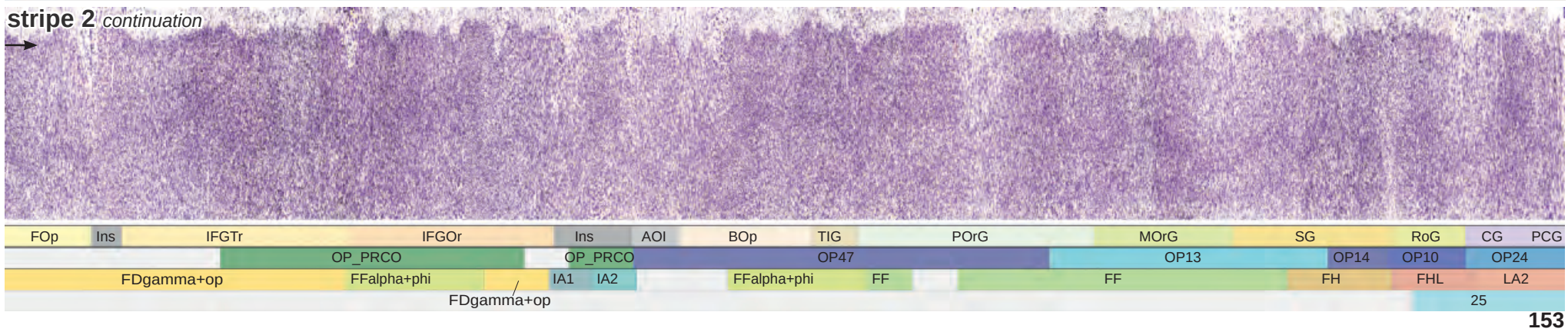
FCL Area frontalis intermedio-limbica.

von Economo and Koskinas (1925) Plate XVII (17)

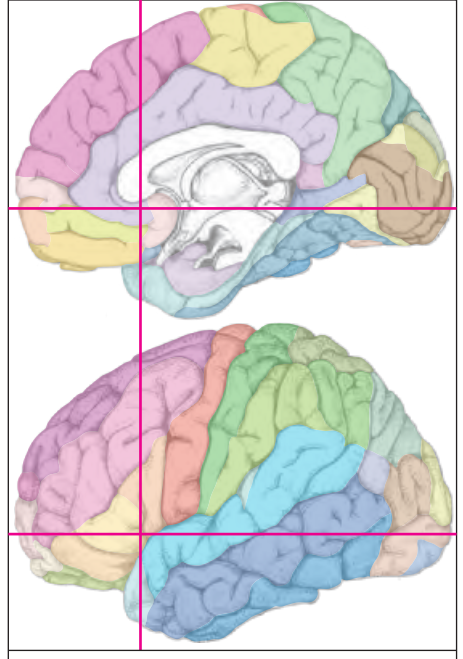








Cortex: Gyri and Sulci



MNI Position y = 18.41 mm
AHB Position y = -17.53 mm

fpms
SFGL
sfs
SFGM
MFG
slf I
cgs-a
slf II
CG
cgb
fmi
ifs
IFGOp
cals
slf III
lls
mls
sfo
scr
gcc
arc
IG
FOp
IFGTr
lf-v
rcc
aic
ec
ex
dgs
lf-v
cals
PCG
racc
unc
IP
IFGTr
acas
ATR
AOI
ofr
CG
sgr
IFGOr
cgs-i
RoG
BOp
lf
TIG
ps
SG
olfs
POrG
pors-m
PPo
MOrG
pors
ps
1p
TPC
ITP

Fiber stain (Weigert)
Section Nr. 18
Slice Nr. 1836

Gyri

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
IP insular pole
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
RoG rostral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
TIG transverse insular gyrus
TPC tempopolar cortex

Sulci

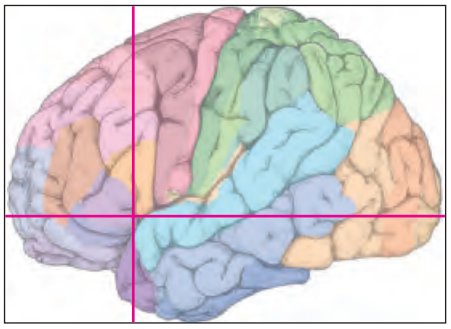
acas accessory callosal sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
dgs diagonal sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus
lf lateral fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
pors transverse olfactory sulcus
pors-m middle transverse olfactory sulcus
ps polar sulcus
sfs superior frontal sulcus

Fibers

1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
cgb cingulum bundle
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
racc radiation of corpus callosum
rcc rostrum of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

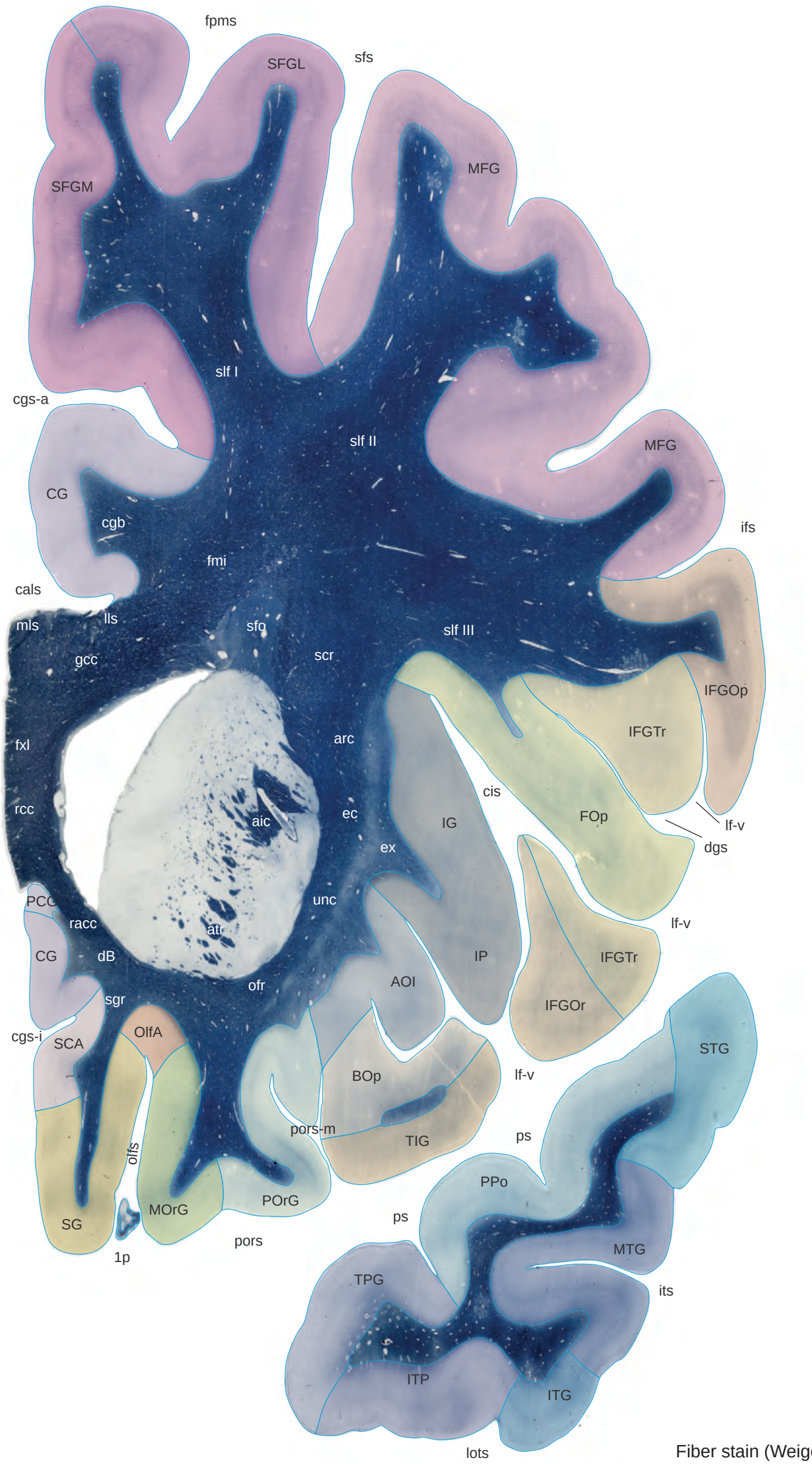
MNI: 18.41
ICL: -17.53
MCP: -32.27

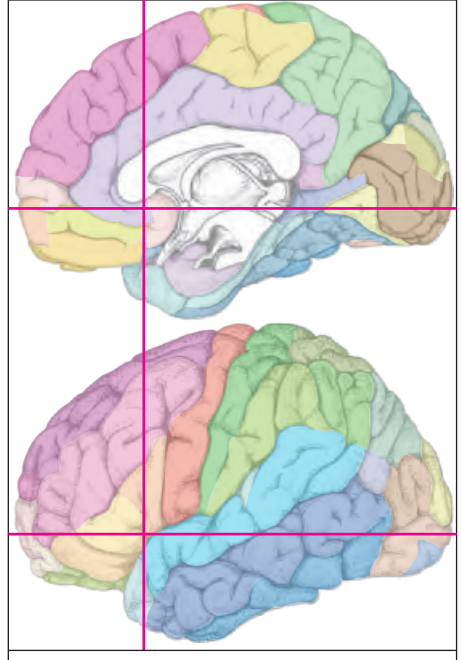


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

1p olfactory peduncle
AcL accumbens n., lateral p.
AO anterior olfactory n. (retrobulbar region)
cals callosal sulcus
calv callosal vein
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
Cl claustrum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
lf lateral (Sylvian) fissure
lf-v vertical ramus of lateral fissure
olfs olfactory sulcus
OP10,13,24,47 areas defined by Öngür et.al. (2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
SB striatal cell bridge
scal subcallosal fc
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sof superior occipitofrontal fasciculus
sts superior temporal sulcus
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex

Cortex: Gyri and Sulci





MNI Position y = 17.06 mm
AHB Position y = -16.24 mm

Gyri

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
IP insular pole
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TIG transverse insular gyrus
TPG tempopolar gyrus

Sulci

cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
cis circular sulcus
dgs diagonal sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus (f2)
its inferior temporal sulcus
lf-v vertical ramus of lateral fissure
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
pors transverse olfactory sulcus
pors-m middle transverse olfactory sulcus
ps polar sulcus
sfs superior frontal sulcus

Fibers

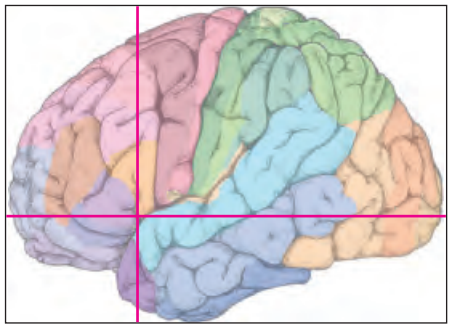
1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
fxl fornix longus
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
racc radiation of corpus callosum
rcc rostrum of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 19
Slice Nr. 1884

Cortex: Brodmann Areas

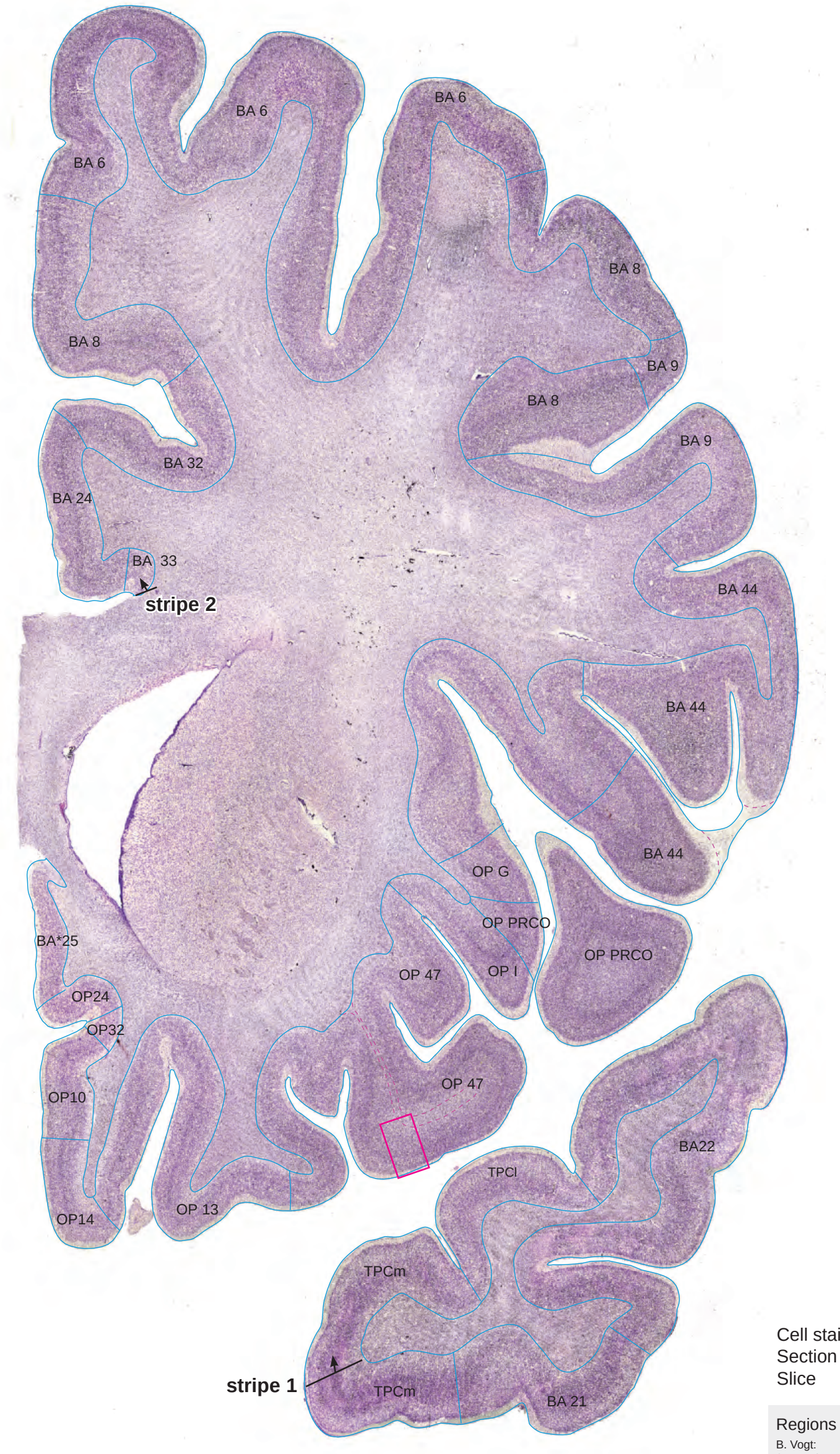
19

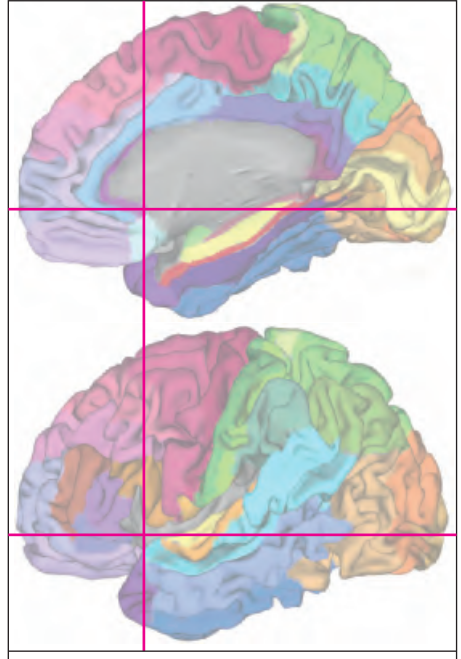
MNI: 17.06
ICL: -16.24
MCP: -30.98



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

1p olfactory peduncle
AcL accumbens n., lateral p.
aic anterior limb of the internal capsule
AO anterior olfactory n. (retrobulbar region)
cals callosal sulcus
calv callosal vein
CdL lateral caudate n.
CdM medial caudate n.
cgs cingulate sulcus
cgs-a cingulate sulcus, anterior p.
Cl claustrum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lls lateral longitudinal stria
mls medial longitudinal stria
olfs olfactory sulcus
OP10,13,14,24,32,47 areas defined by Öngür et.al. (2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
SB striatal cell bridge
scal subcallosal fc
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sts superior temporal sulcus
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex





MNI Position y = 17.03 mm
AHB Position y = -16.21 mm

Gyral Pattern

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
IP insular pole
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MOrG medial orbital gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCG precallosal gyrus
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TIG transverse insular gyrus
TPG tempopolar gyrus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA25 area subgenualis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP24 area 24 (by Öngür et al. 2003)
OP32 area 32 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
OP_G gustatory cortex (by Öngür et al. 2003)
OP_I agranular insular cortex (by Öngür et al. 2003)
OP_PRCO precentral opercular area (by Öngür et al. 2003)
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

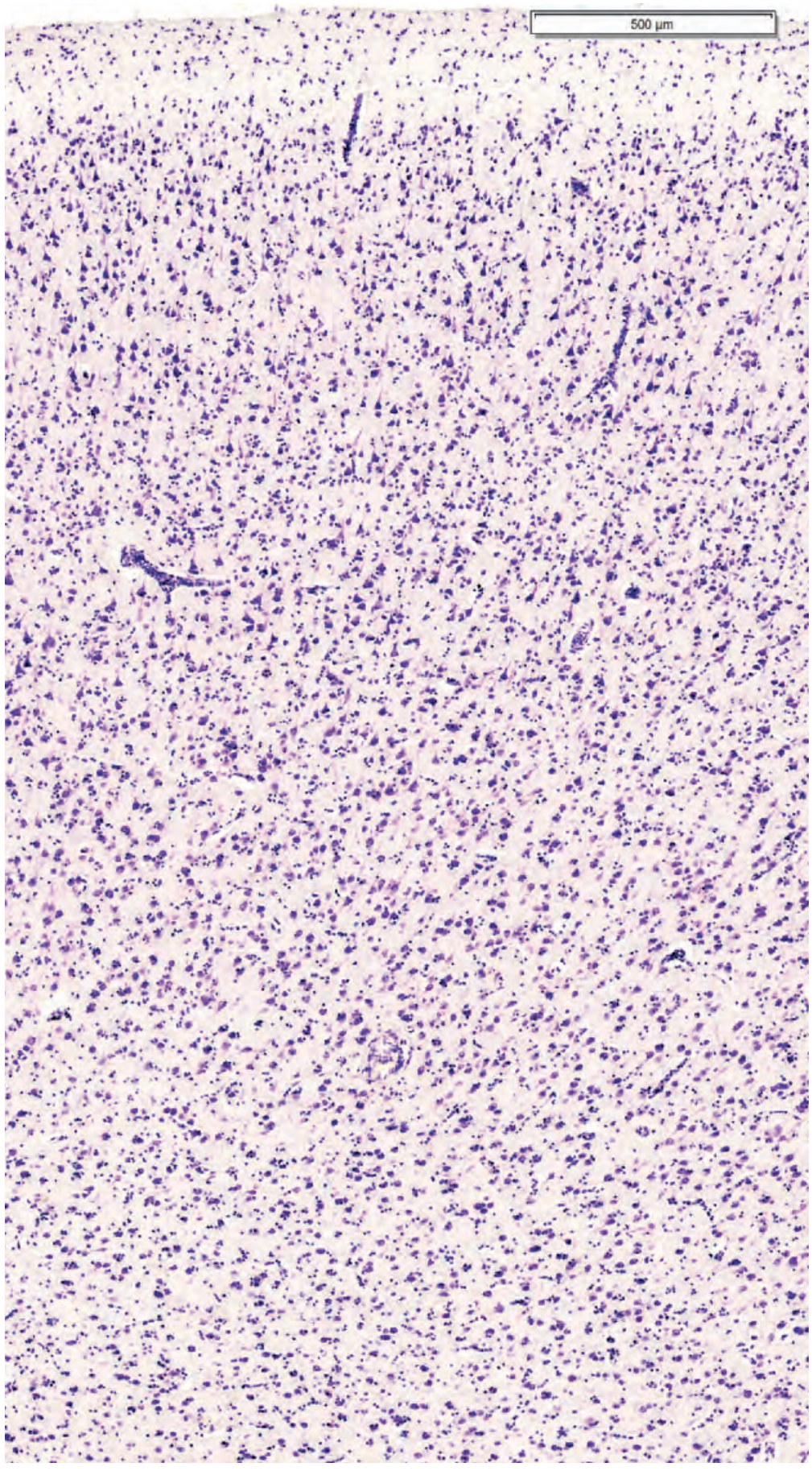
von Economo and Koskinas

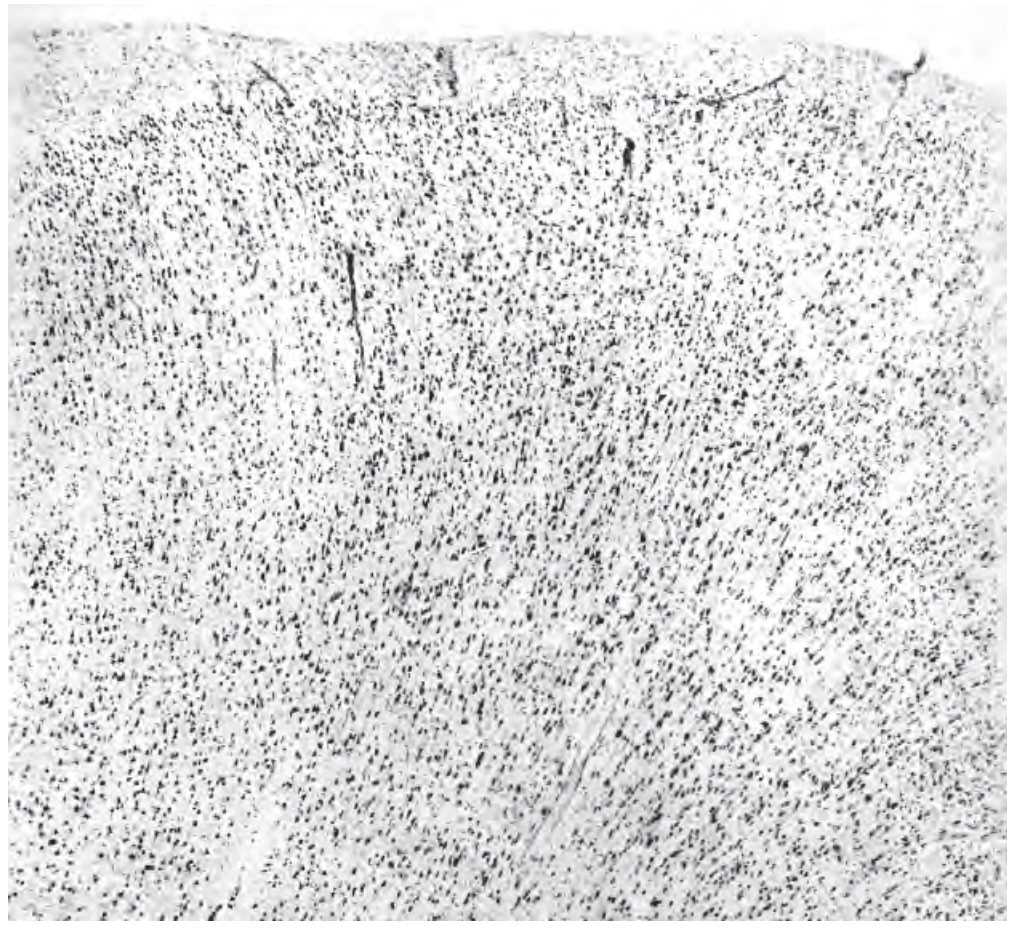
FB agranular frontal area
FB agranular frontal area
FC intermediate frontal area
FDgamma+op triangular and opercular granular frontal area
FF granular orbital area
FFalpha+phi agranular und pretriangular orbital area
FH prefrontal area
FHL parolfactory prefrontal area
FL parolfactory area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TG temporo polar area

Cell stain (Nissl):
Section Nr. 19
Slice Nr. 1885

Regions of Interest

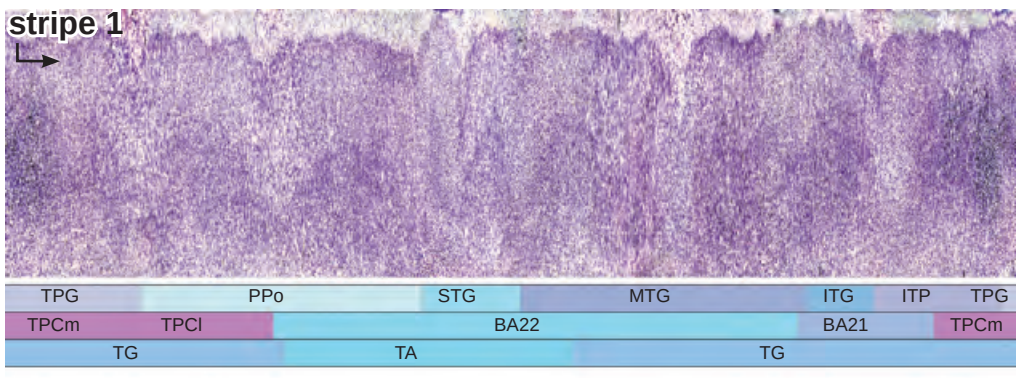
B. Vogt:
25 BA25
a24c' anterior division of BA24
a24' anterior division of BA24
a33' anterior subregion of BA33

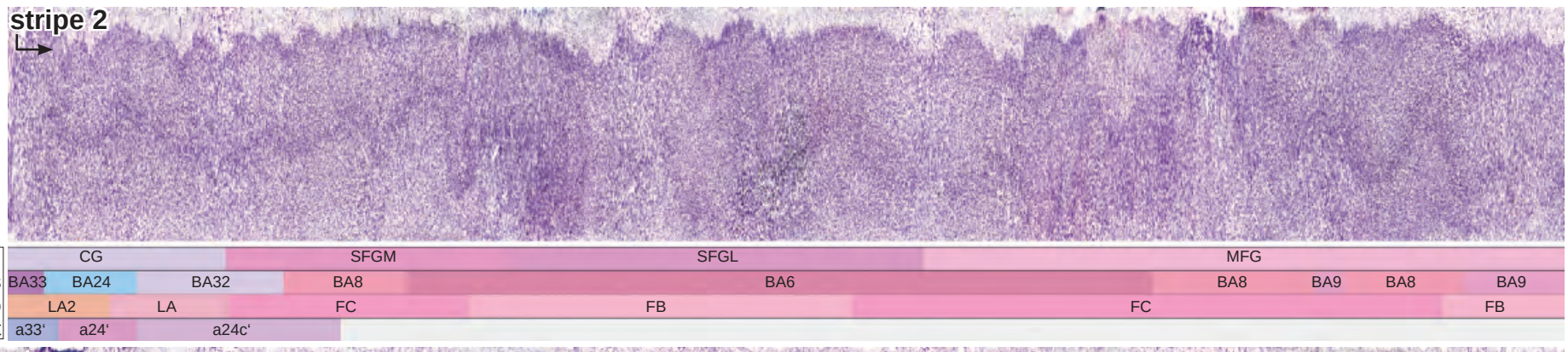


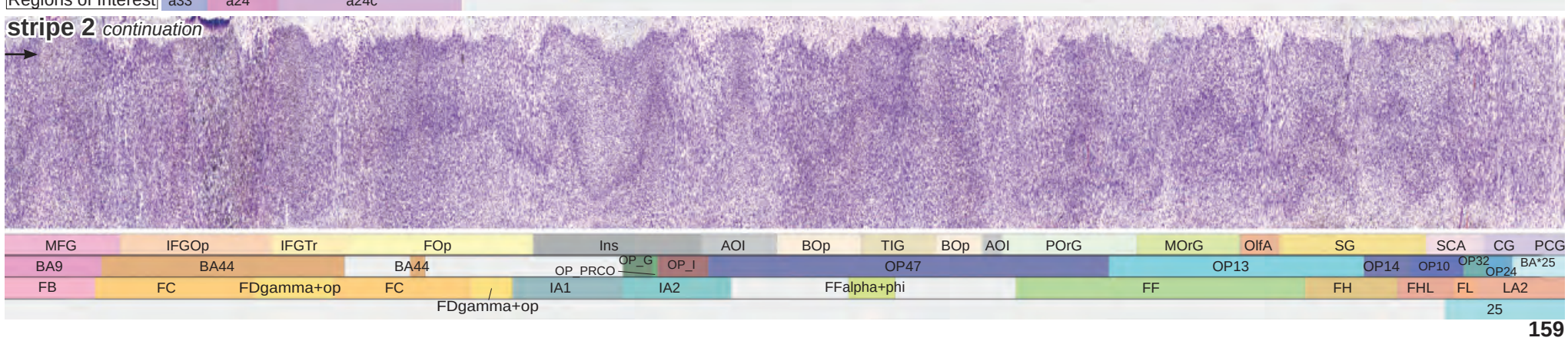


FI Area frontoinsularis.

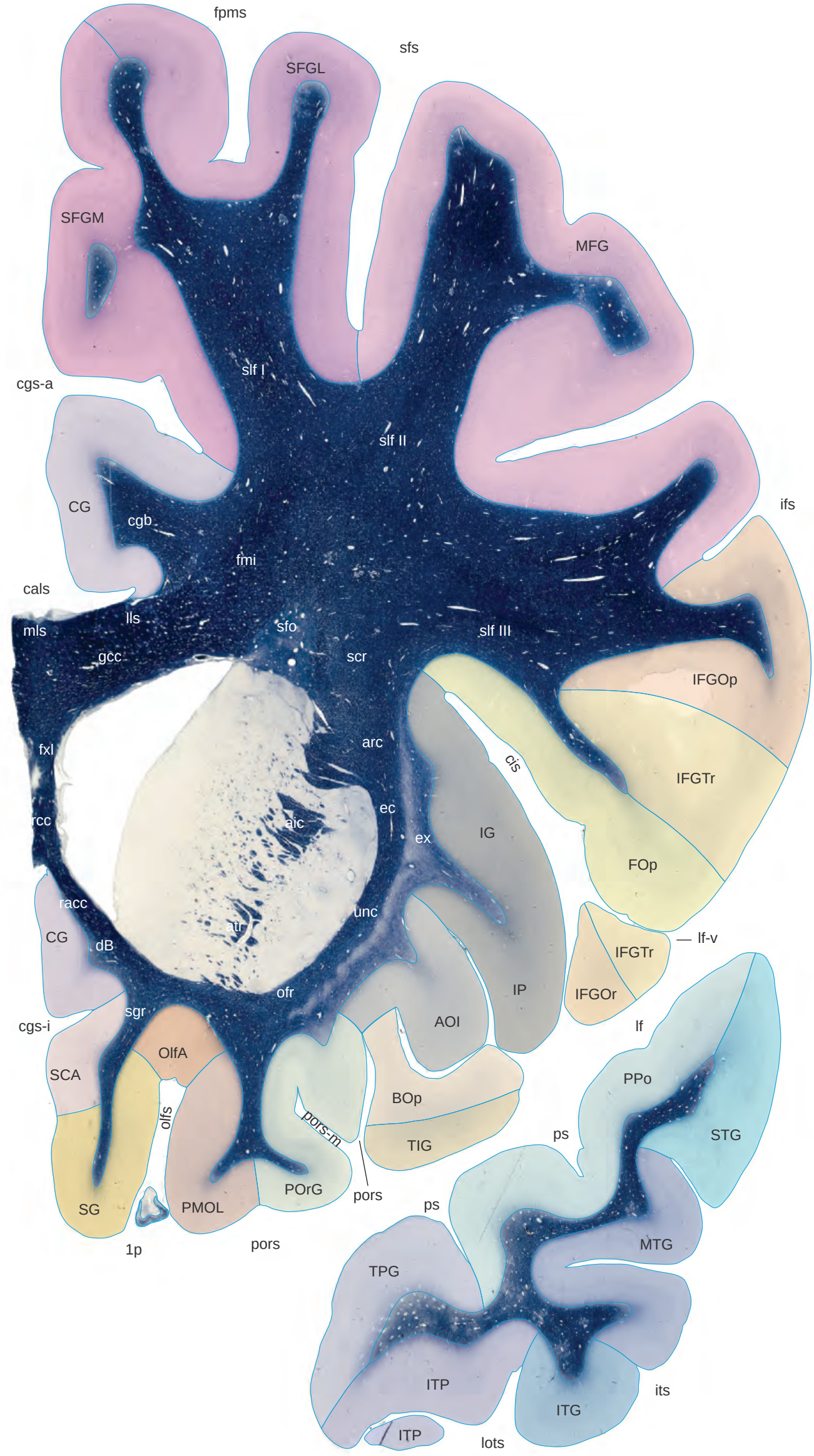
von Economo and Koskinas (1925) Plate XLII (42)

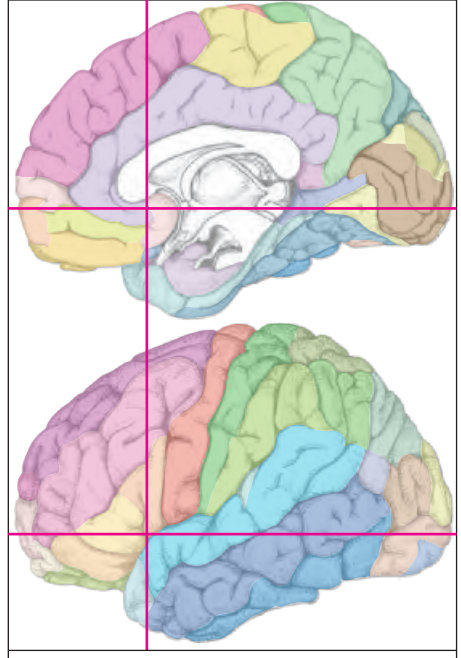



stripe 2
Gyral pattern CG SFGM SFGL MFG
Brodmann areas BA33 BA24 BA32 BA8 BA6 BA8 BA9 BA8 BA9
von Economo LA2 LA FC FB FC FB
Regions of Interest a33' a24' a24c'


stripe 2 continuation
MFG IFGOp IFGTr FOp Ins AOI BOp TIG BOp AOI POrG MOrG OlfA SG SCA CG PCG
BA9 BA44 BA44 OP_PRCO OP_G OP_I OP47 OP13 OP14 OP10 OP32 OP24 BA*25
FB FC FDgamma+op FC IA1 IA2 FFalpha+phi FF FH FHL FL LA2
FDgamma+op
25

Cortex: Gyri and Sulci





MNI Position y = 15.82 mm
AHB Position y = -15.06 mm

Gyri

AOI Area orbitoinsularis
CG cingulate gyrus
BOp basal operculum
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IG insular gyrus
IP insular pole
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PMOL posteromedial orbital lobule
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TIG transverse insular gyrus
TPG tempopolar gyrus

Sulci

cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cgs-i cingulate sulcus, inferior part
cis circular sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus (f2)
its inferior temporal sulcus
lf lateral fissure
lf-v vertical ramus of lateral fissure
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
pors post. olfactory sulcus
pors-m middle post. olfactory sulcus
ps polar sulcus
sfs superior frontal sulcus

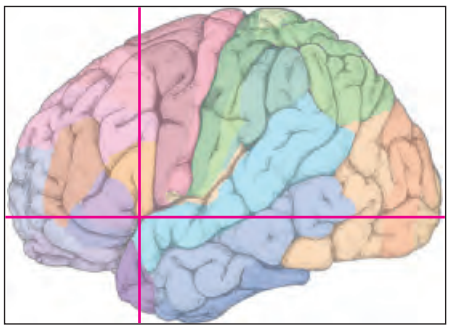
Fibers

1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
fxl fornix longus
gcc genu of corpus callosum
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
racc radiation of corpus callosum
rcc rostrum of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 20
Slice Nr. 1928

Cortex: Brodmann Areas

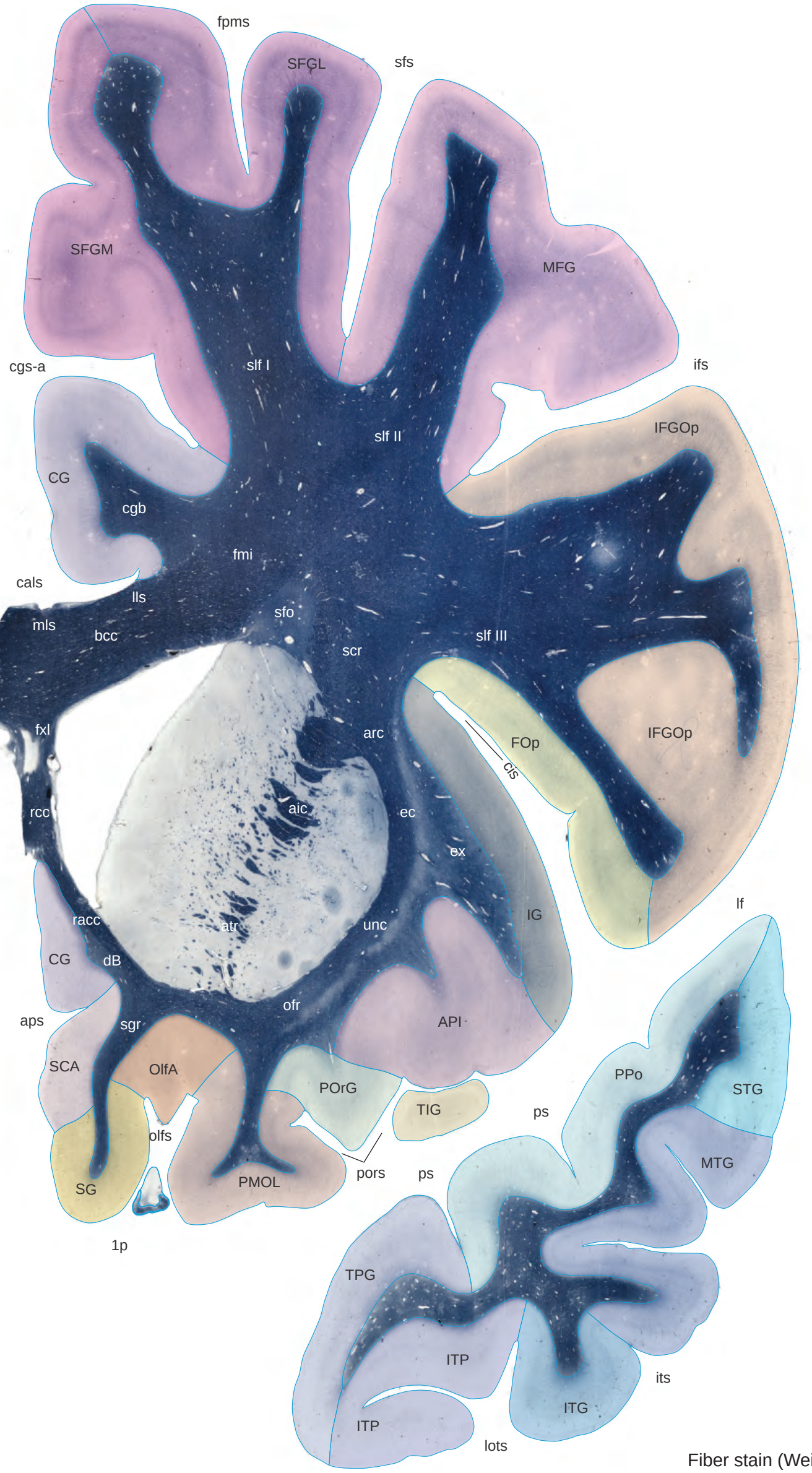
MNI: 15.82
ICL: -15.06
MCP: -29.80

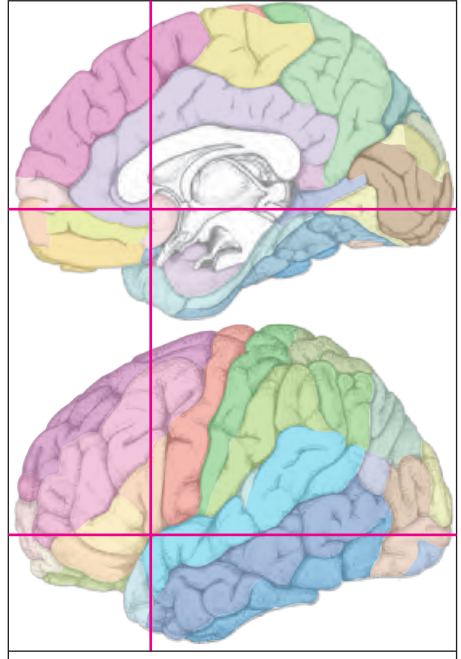


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

1p olfactory peduncle
AcL accumbens n., lateral p.
aic anterior limb of the internal capsule
AO anterior olfactory n. (retrobulbar region)
cals callosal sulcus
calv callosal vein
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cgs-i inferior cingulate sulcus
cis circular insular sulcus
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fmi forceps minor of corpus callosum
fpms frontal paramidline sulcus
FPu fundus region of putamen
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lls lateral longitudinal stria
lots lateral occipitotemporal sulcus
mls medial longitudinal stria
OlfA olfactory area
olfs olfactory sulcus
OP10,13,14,24,32,47 areas defined by Öngür et.al. (2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
OP PRCO precentral opercular area (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
PPCl prepiriform claustrum
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
scal subcallosal fc
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sts superior temporal sulcus
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex

Cortex: Gyri and Sulci





MNI Position y = 14.22 mm
AHB Position y = -13.56 mm

Gyri

API area piriformis insulae
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PMOL posteromedial orbital lobule
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TIG transverse insular gyrus
TPG tempopolar gyrus

Sulci

aps anterior parolfactory sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus (f2)
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
pors transverse olfactory sulcus
ps polar sulcus
sfs superior frontal sulcus

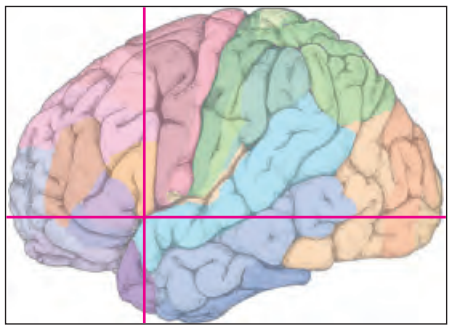
Fibers

1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
fxl fornix longus
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
racc radiation of corpus callosum
rcc rostrum of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 21
Slice Nr. 1984

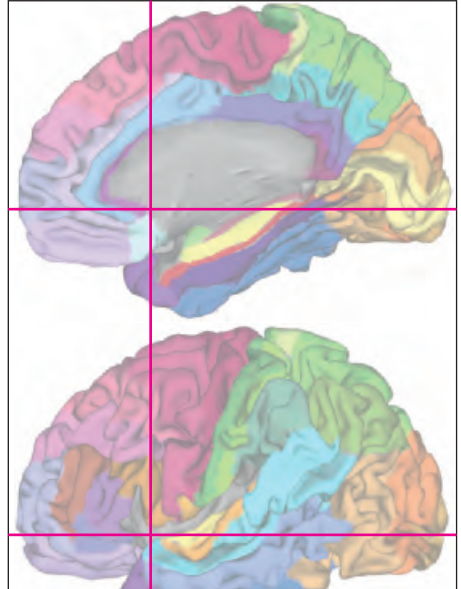
Cortex: Brodmann Areas

MNI: 14.22
ICL: -13.56
MCP: -28.30



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

1p olfactory peduncle
AcL accumbens n., lateral p.
AO anterior olfactory n. (retrobulbar region)
aps anterior parolfactory sulcus
cals callosal sulcus
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
Cl claustrum
CSP cavity of septum pellucidum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
gcc genu of corpus callosum
ifs inferior frontal sulcus
IGr indusium griseum
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
OP10,13,14,32,47 areas defined by Öngür et.al. (2003)
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
pors posterior orbital sulcus
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
scal subcallosal fc
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sts superior temporal sulcus
sv septal vein
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex



MNI Position y = 14.28 mm
AHB Position y = -13.59 mm

Gyral Pattern

API area piriformis insulae
CG cingulate gyrus
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PMOL posteromedial orbital lobule
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TIG transverse insular gyrus
TPG tempopolar gyrus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA25 area subgenualis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP32 area 32 (by Öngür et al. 2003)
OP47 area 47 (by Öngür et al. 2003)
OP_AON anterior olfactory nucleus (by Öngür et al. 2003)
OP_G gustatory cortex (by Öngür et al. 2003)
OP_I agranular insular cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

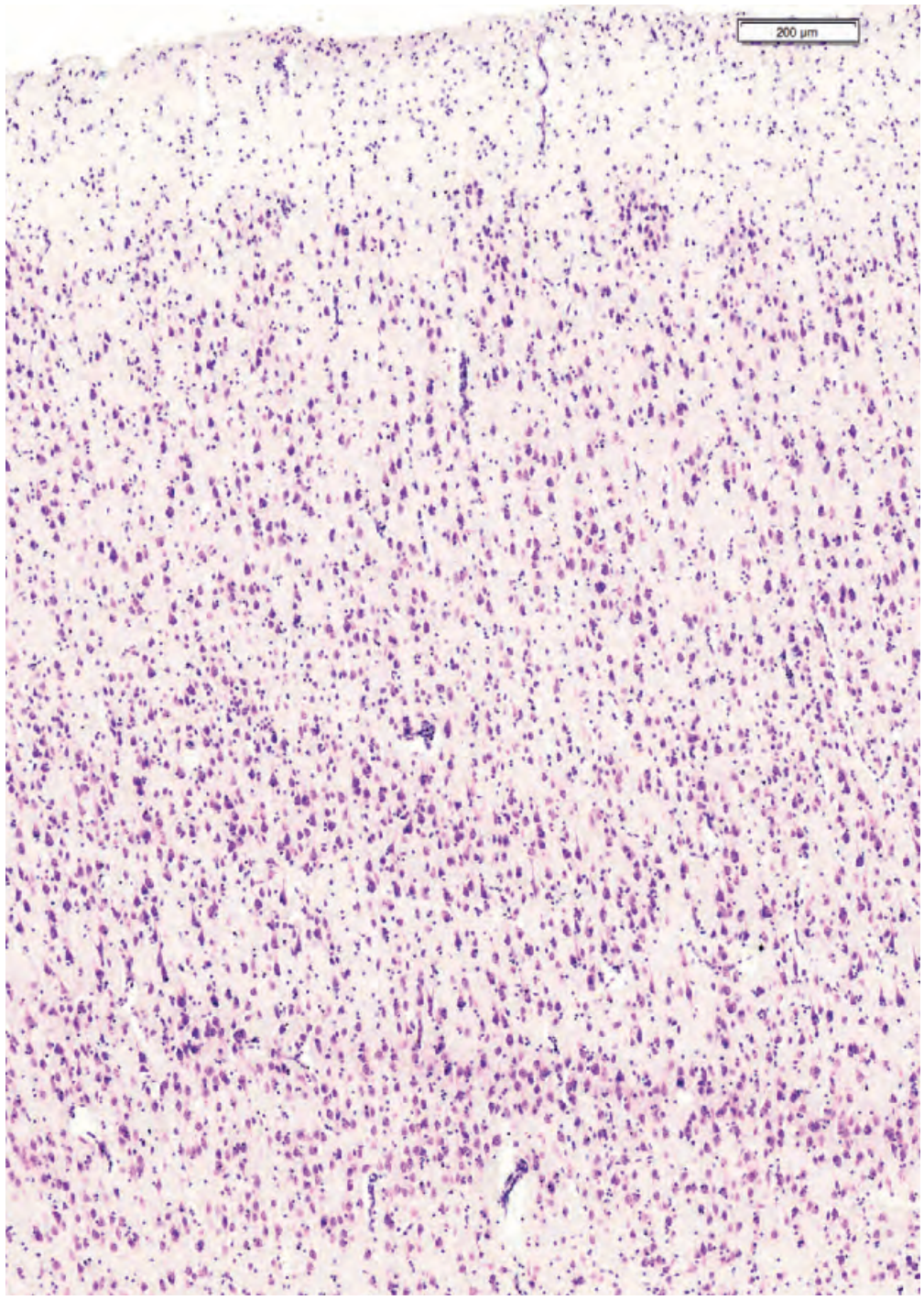
von Economo and Koskinas

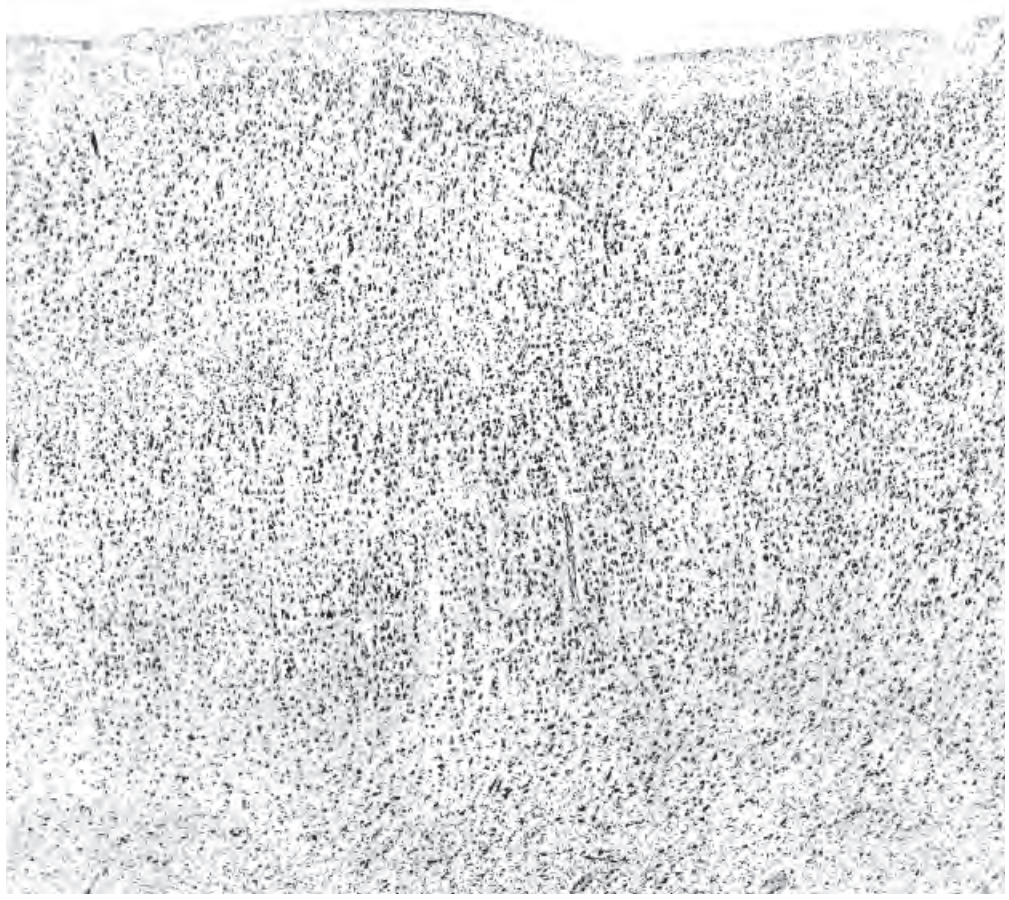
FB agranular frontal area
FC intermediate frontal area
FF granular orbital area
FH prefrontal area
FHL parolfactory prefrontal area
FL parolfactory area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

B. Vogt:
25 BA25
a24c' anterior division of BA24
a24' anterior division of BA24
a33' anterior subregion of BA33

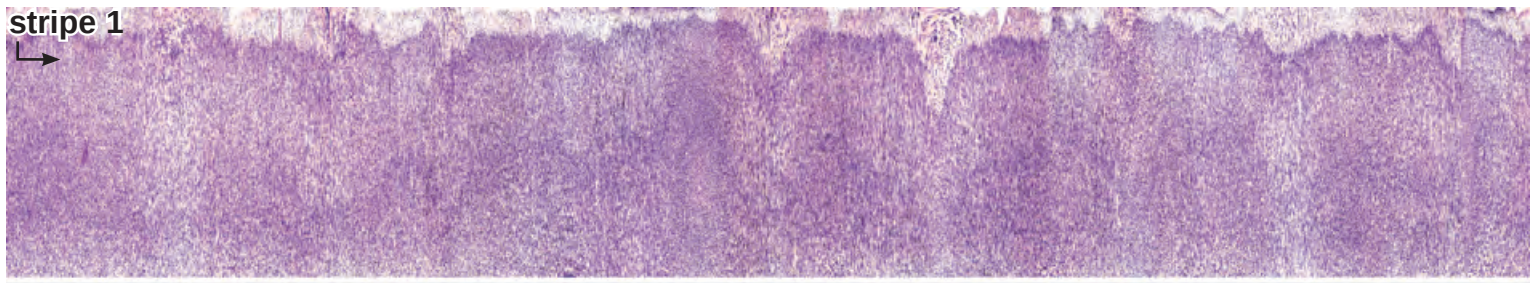
Cell stain (Nissl):
Section Nr. 21
Slice Nr. 1983

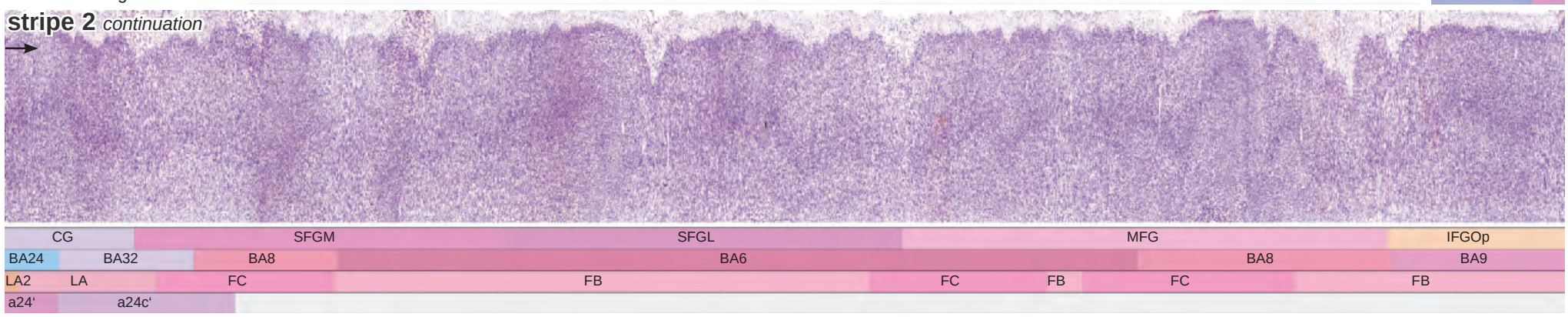


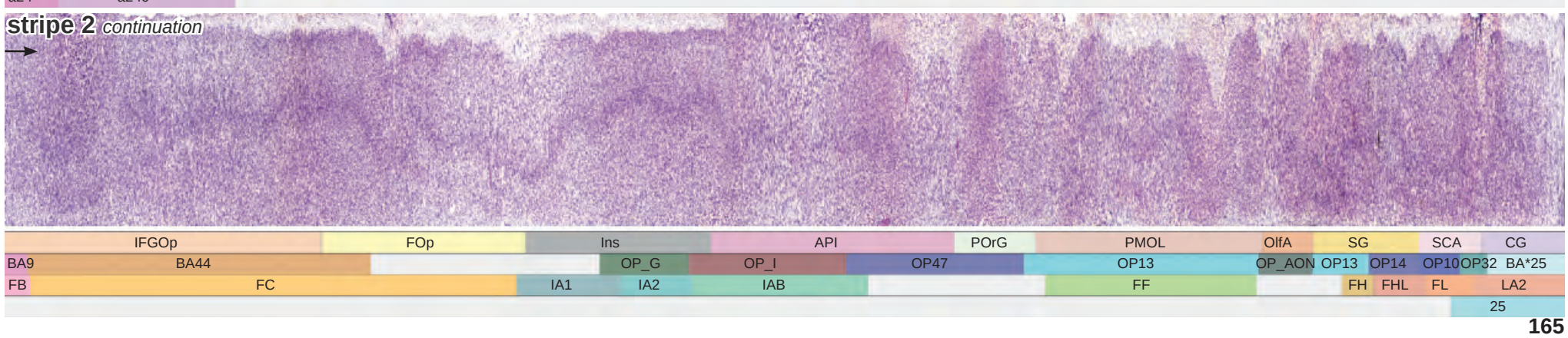


FH Area praefrontalis. FHL Area praefrontalis parolfactoria.

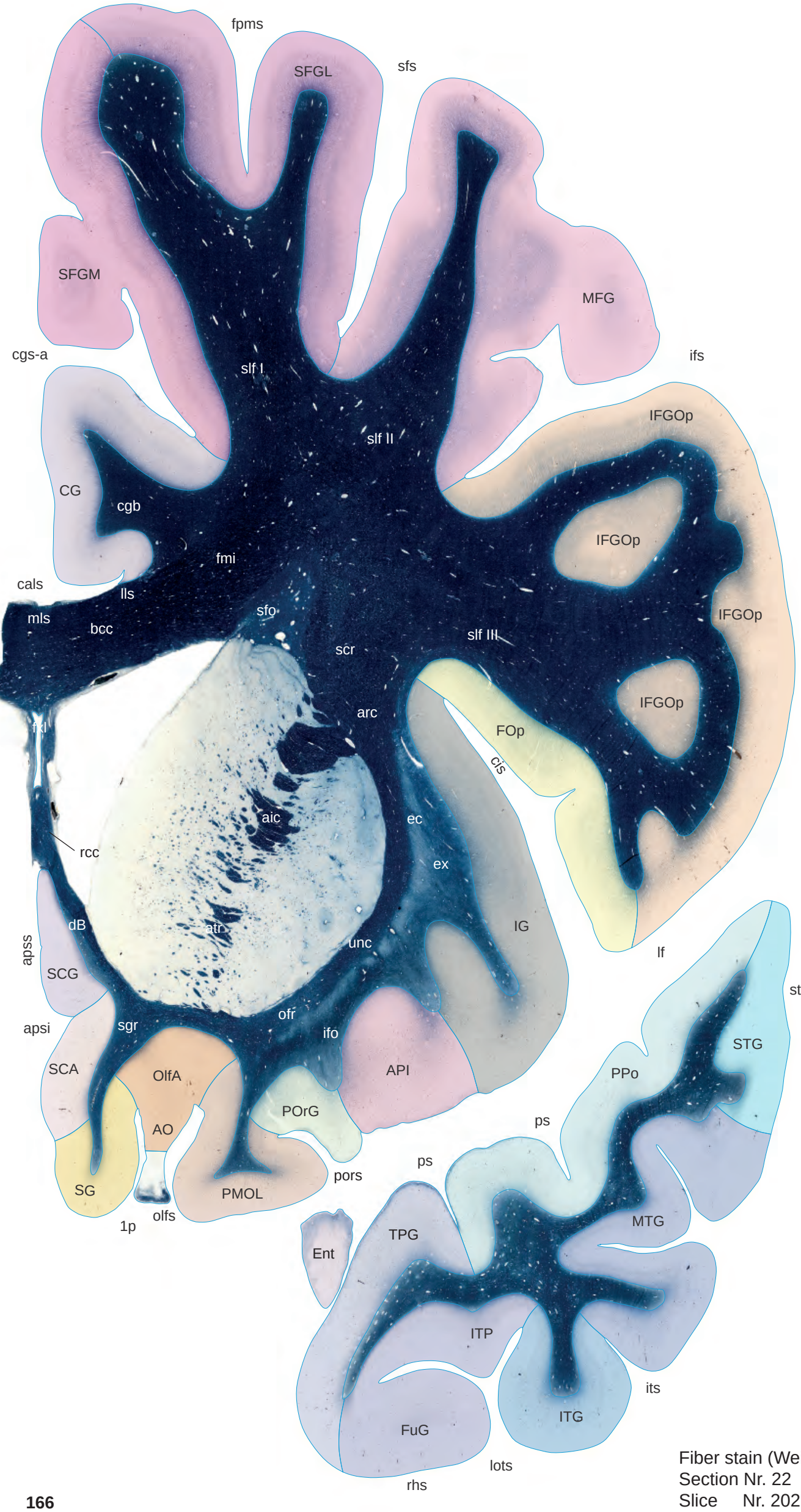
FL1 Area parolfactoria (prima). von Economo and Koskinas (1925) Plate XXXIX (39)

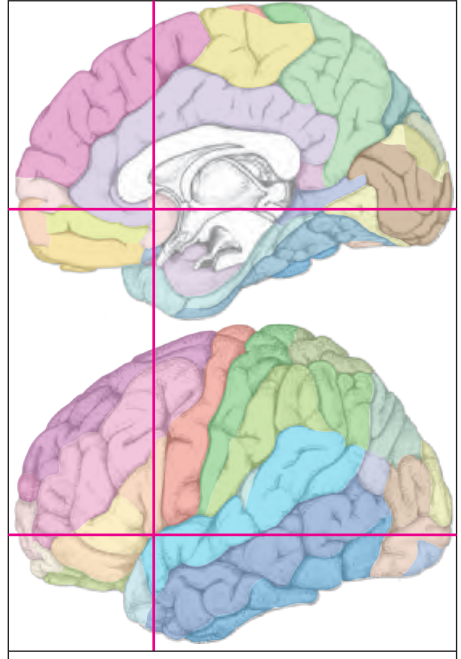





stripe 2 continuation
IFGOp FOp Ins API POrG PMOL OlfA SG SCA CG
BA9 BA44 OP_G OP_I OP47 OP13 OP_AON OP13 OP14 OP10 OP32 BA*25
FB FC IA1 IA2 IAB FF FH FHL FL LA2
25

Cortex: Gyri and Sulci





MNI Position y = 13.01 mm
AHB Position y = -12.41 mm

Fiber stain (Weigert)
Section Nr. 22
Slice Nr. 2027

Gyri

API area piriformis insulae
AO anterior olfactory n. (retrobulbar region)
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PMOL posteromedial orbital lobule
POrG posterior orbital gyrus
PPo planum polare
SCA subcallosal area
SCG cingulate gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TPG tempopolar gyrus

Sulci

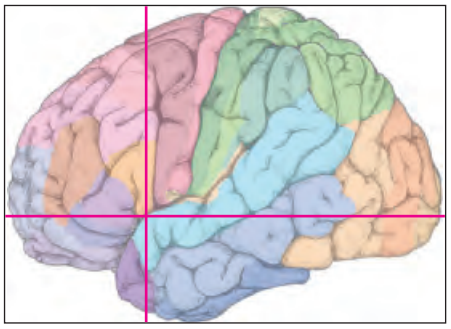
apsi anterior parolfactory sulcus, inf. branch
apss anterior parolfactory sulcus, sup.branch
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
ifs inferior frontal sulcus (f2)
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
pors transverse olfactory sulcus
ps polar sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sts superior temporal sulcus

Fibers

1p olfactory peduncle
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
fxl fornix longus
ifo inferior fronto-occipital fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
rcc rostrum of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
sgr radiation of straight gyrus
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

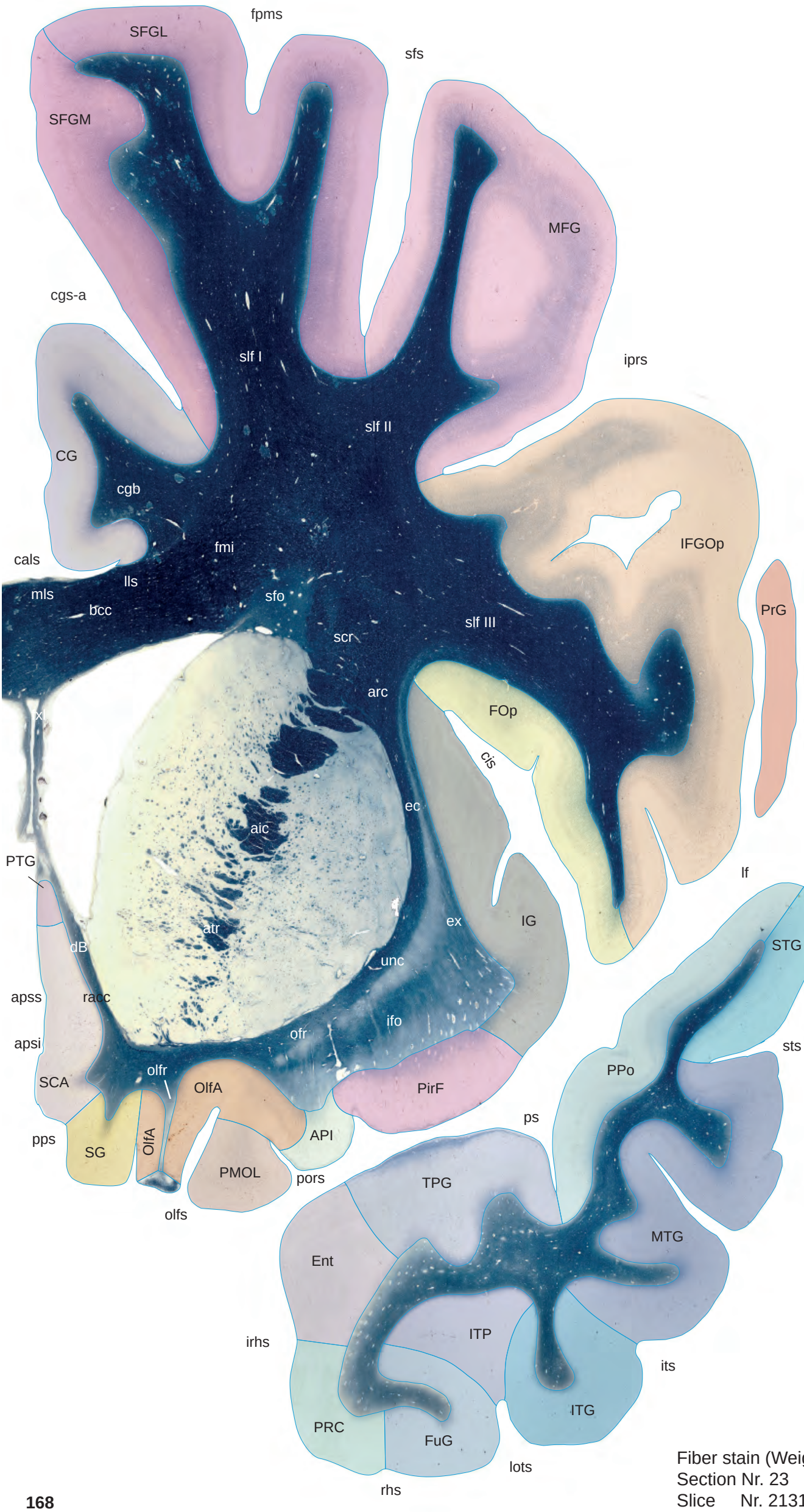
MNI: 13.01
ICL: -12.41
MCP: -27.15

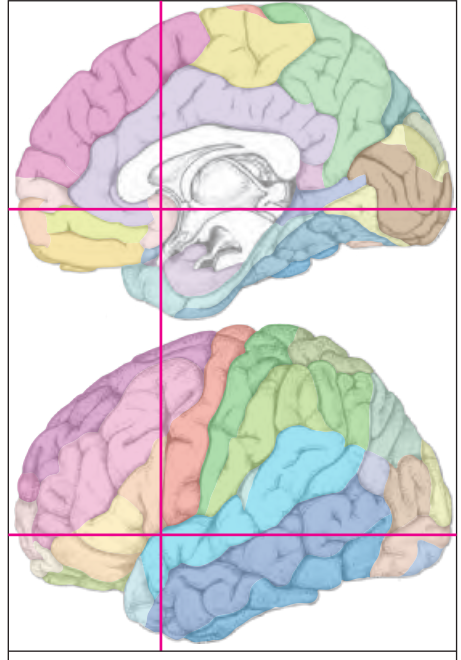


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

1p olfactory peduncle
AcL accumbens n., lateral p.
aic anterior limb of the internal capsule
AO anterior olfactory n. (retrobulbar region)
apsi anterior parolfactory sulcus, inf. branch
apss anterior parolfactory sulcus, sup.branch
cals callosal sulcus
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
CSP cavity of septum pellucidum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fmi forceps minor of corpus callosum
fpms frontal paramidline sulcus
FPu fundus region of putamen
ifs inferior frontal sulcus
IGr indusium griseum
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
OlfA olfactory area
OP10,13,14,32 areas defined by Öngür et.al. (2003)
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
olfs olfactory sulcus
PMOL posteromedial orbital lobule
pors posterior orbital sulcus
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
Pu putamen
racc radiation of corpus callosum
rhs rhinal sulcus
SB striatal cell bridge
scal subcallosal fc
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
sts superior temporal sulcus
sv septal vein
TPCl lateral temporopolar cortex
TPCm medial temporopolar cortex

Cortex: Gyri and Sulci





MNI Position y = 10.11 mm
AHB Position y = -9.62 mm

Fiber stain (Weigert)
Section Nr. 23
Slice Nr. 2131

Gyri

API area piriformis insulae
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PirF piriform cortex, frontal part
PMOL posteromedial orbital lobule
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TPG tempopolar gyrus

Sulci

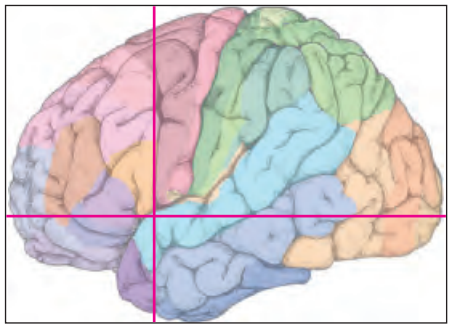
apsi anterior parolfactory sulcus, inf. branch
apss anterior parolfactory sulcus, sup.branch
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
olfs olfactory sulcus
pors transverse olfactory sulcus
pps posterior parolfactory sulcus
ps polar sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sts superior temporal sulcus

Fibers

aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fmi forceps minor of the corpus callosum
fxl fornix longus
ifo inferior fronto-occipital fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
olfr olfactory radiation
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

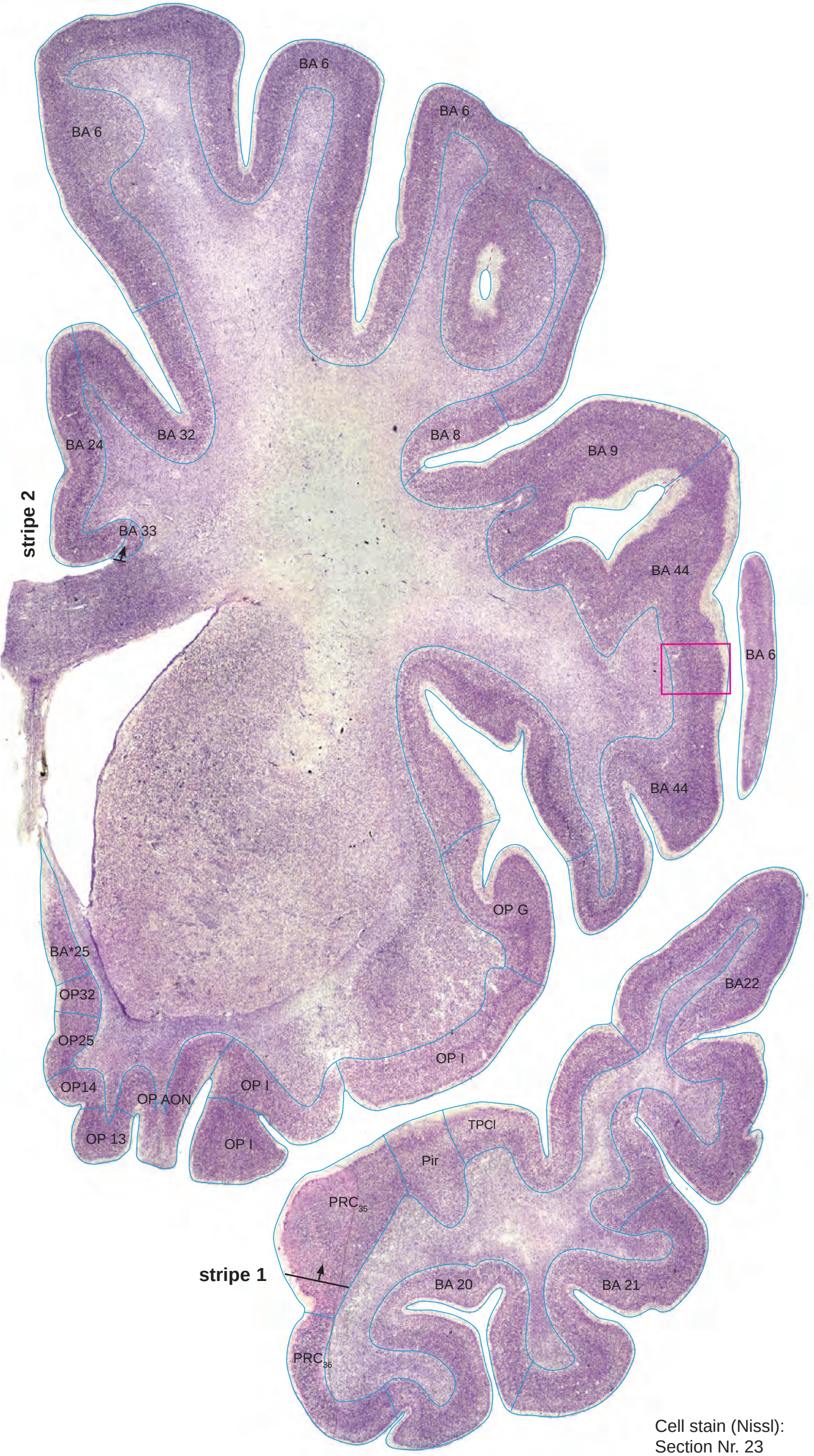
Cortex: Brodmann Areas

MNI: 10.11
ICL: -9.62
MCP: -24.36

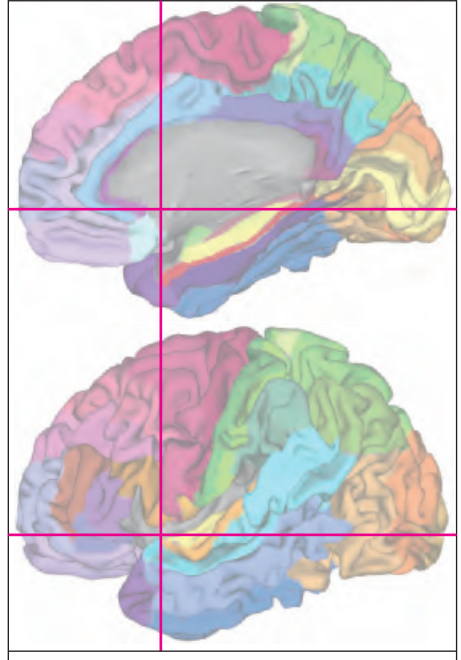


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
apsi anterior parolfactory sulcus, inf. branch
apss anterior parolfactory sulcus, sup.branch
cals callosal sulcus
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
CSP cavity of septum pellucidum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fmi forceps minor of corpus callosum
fpms frontal paramidline sulcus
FPu fundus region of putamen
ifo inferior fronto-occipital fascicle
IGr indusium griseum
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
olf olfactory peduncle
olfs olfactory sulcus
OP10,13,14,32 areas defined by Öngür et.al. (2003)
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
ors orbital sulcus
Pir piriform cortex
PPCl prepiriform claustrum
pps posterior parolfactory sulcus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
rhs rhinal sulcus
scal subcallosal fc
sfo superior fronto-occipital fc
sfs superior frontal sulcus
SGl substantia gliosa
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TPCl lateral temporopolar cortex



Cell stain (Nissl):
Section Nr. 23
Slice Nr. 2130



MNI Position y = 10.14 mm
AHB Position y = -9.65 mm

Gyral Pattern

API area piriformis insulae
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PirF piriform cortex, frontal part
PMOL posteromedial orbital lobule
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SG straight gyrus
STG superior temporal gyrus
TPG tempopolar gyrus

Brodmann Areas

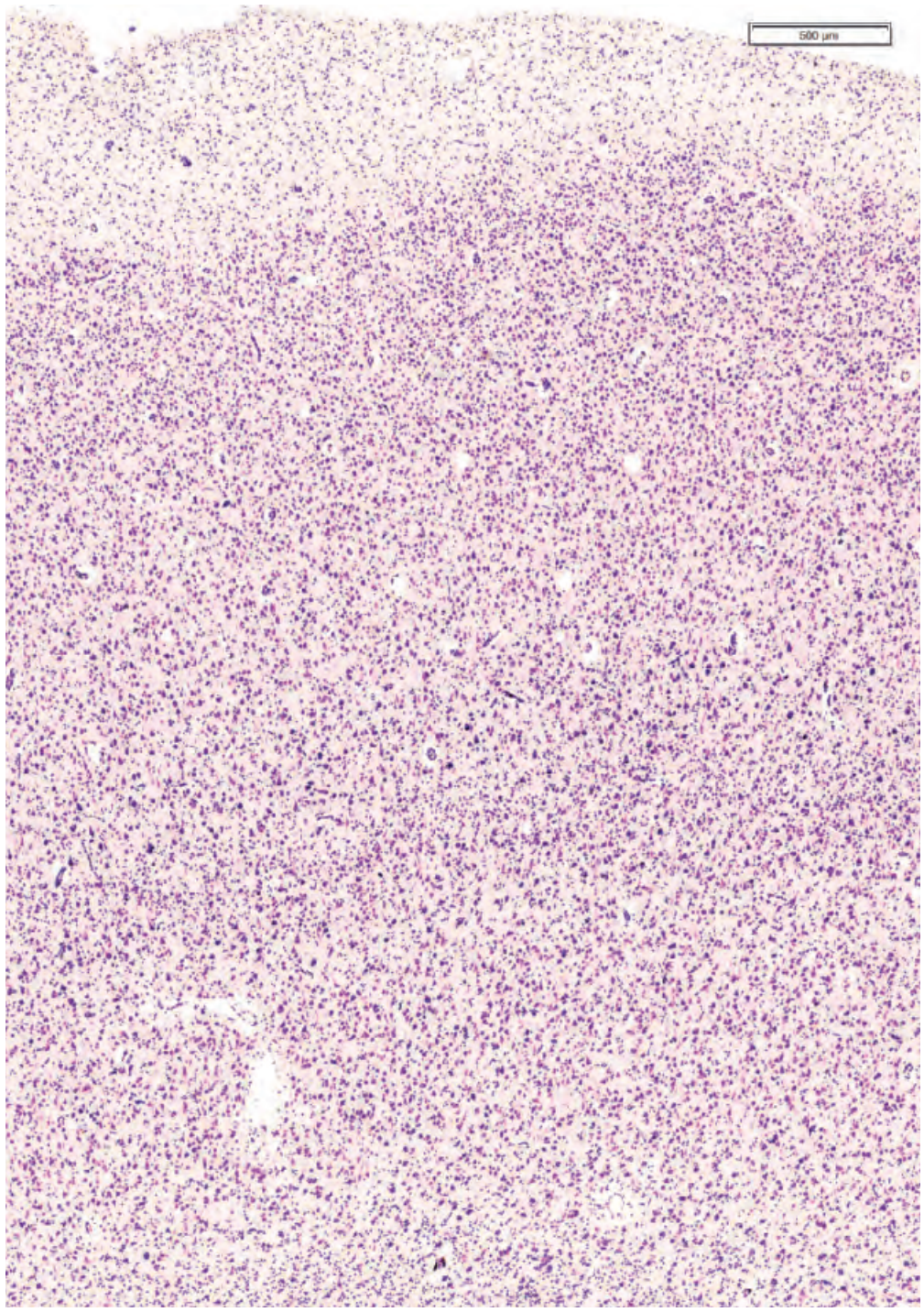
BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA25 area subgenualis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
OP10 area 10 (by Öngür et al. 2003)
OP13 area 13 (by Öngür et al. 2003)
OP14 area 14 (by Öngür et al. 2003)
OP32 area 32 (by Öngür et al. 2003)
OP_AON anterior olfactory nucleus (by Öngür et al. 2003)
OP_G gustatory cortex (by Öngür et al. 2003)
OP_I agranular insular cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pir piriform cortex
TPCl lateral temporopolar cortex
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

von Economo and Koskinas

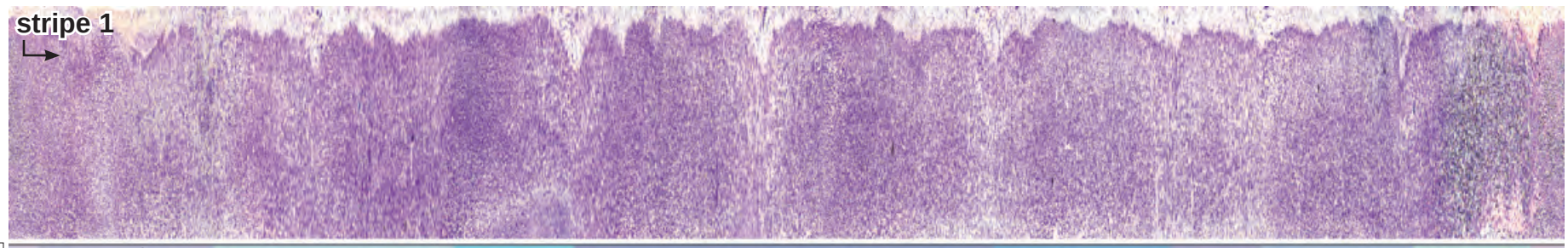
FB agranular frontal area
FC intermediate frontal area
FL parolfactory area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
La precingulate agranular anterior limbic area
La2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

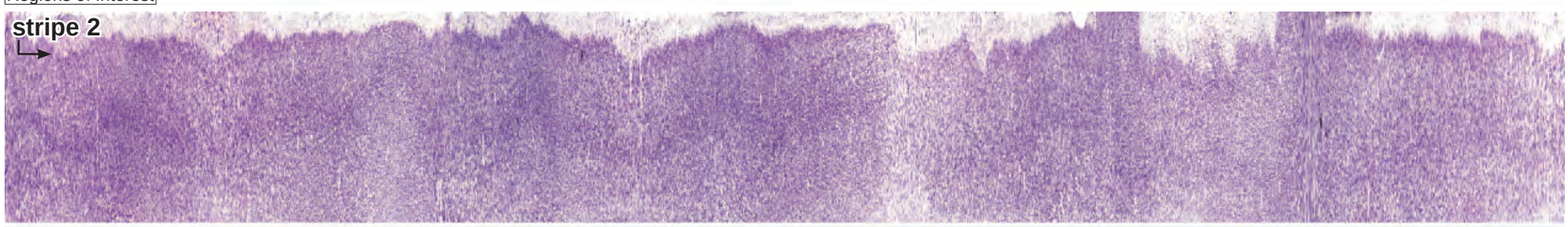
B. Vogt:
a24c‘ anterior division of BA24
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24



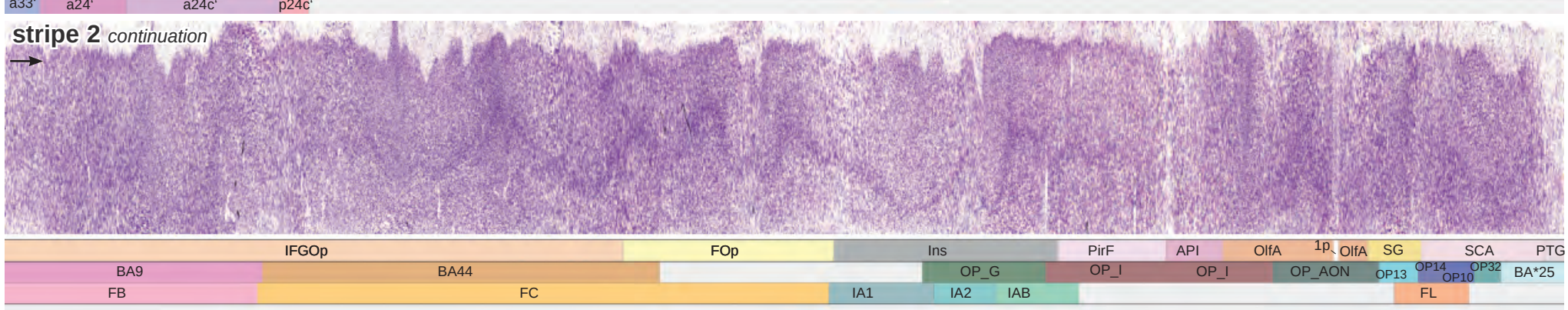
FCBm Area frontalis intermedio-agranularis magnocellularis in Campo BROCA. von Economo and Koskinas (1925) Plate XV (15)



Gyral pattern	Ent	TPG	PPo	STG	MTG	ITG	ITP	FuG	PRC	Ent				
Brodmann areas	PRC_{36}	Pir	TPCl	BA22	BA21	BA20	PRC_{35}	PRC_{36}						
von Economo	TG	TA	TE1	TA	TE1	TE2	TG							
Regions of Interest														

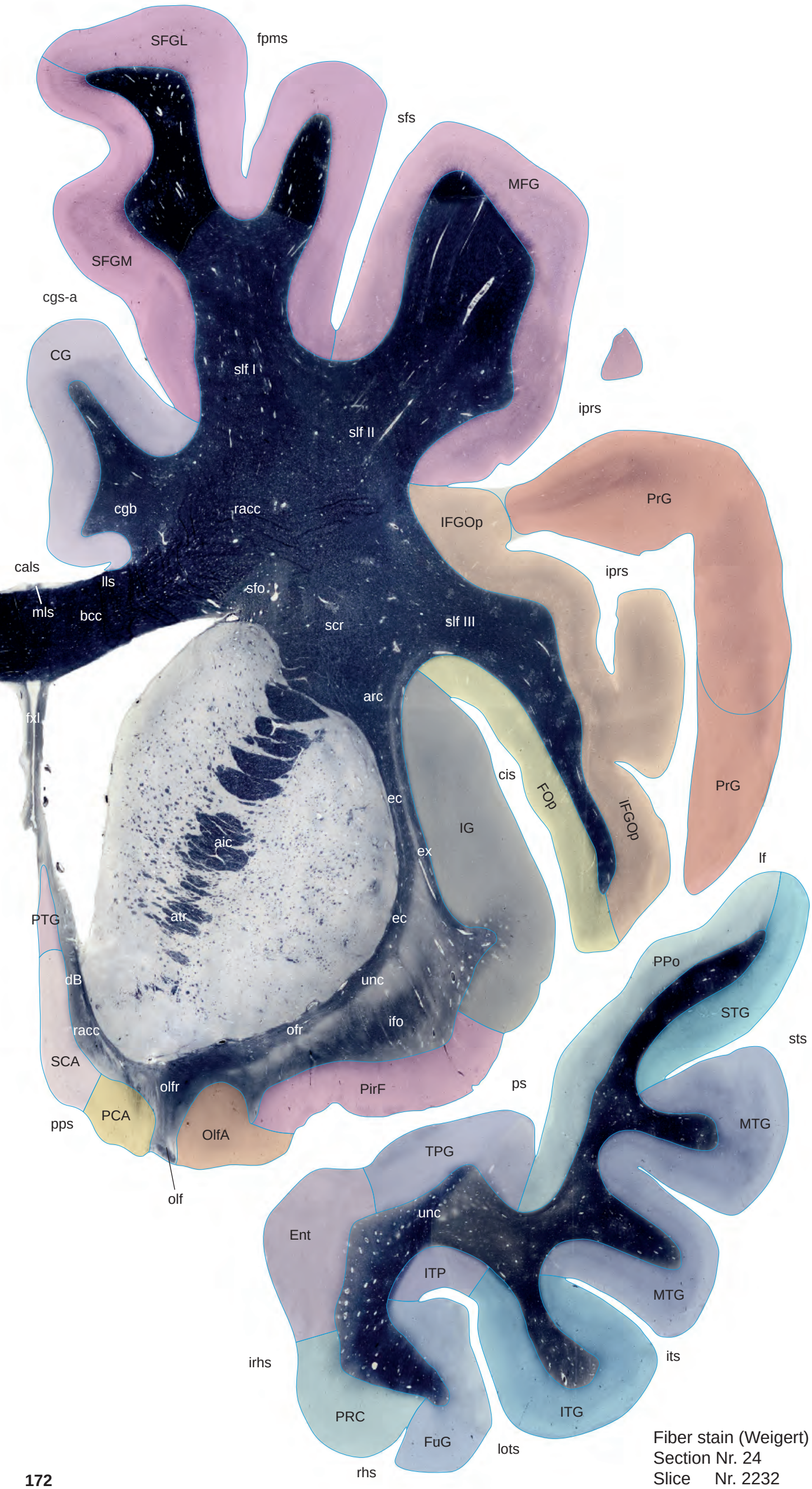


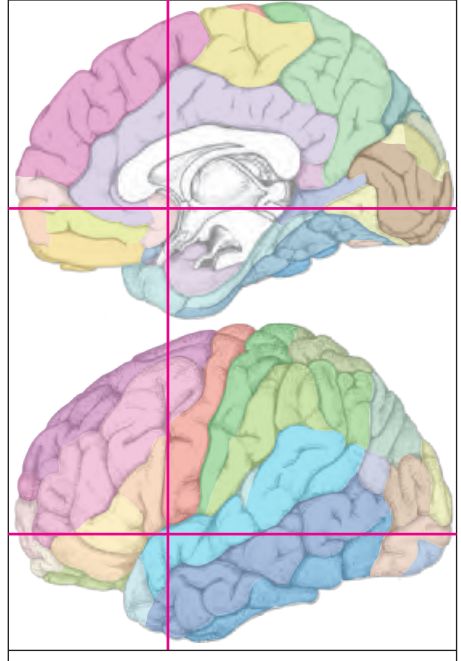
CG	SFGM	SFGL	MFG	IFGOp										
BA33	BA24	BA32	BA6	BA8	BA9									
La2	La	FC	FB	FC	FB									
a33‘	a24‘	a24c‘	p24c‘											



IFGOp	FOp	Ins	PirF	API	OlfA	1p	OlfA	SG	SCA	PTG				
BA9	BA44	OP_G	OP_I	OP_I	OP_AON	OP13	OP14	OP10	OP32	BA*25				
FB	FC	IA1	IA2	IAB	FL									

Cortex: Gyri and Sulci





MNI Position y = 7.18 mm
AHB Position y = -6.91 mm

Fiber stain (Weigert)
Section Nr. 24
Slice Nr. 2232

Gyri

CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
IG insular gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCA precommissural archicortex
PirF piriform cortex, frontal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TPG tempopolar gyrus

Sulci

cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pps posterior parolfactory sulcus
ps polar sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sts superior temporal sulcus

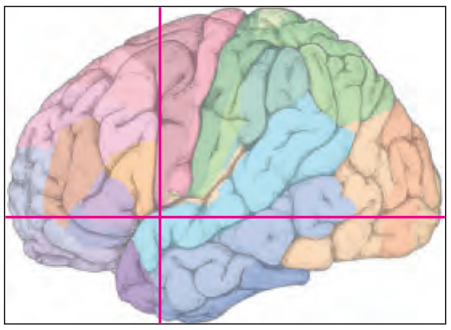
Fibers

aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fxl fornix longus
ifo inferior fronto-occipital fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
olf olfactory peduncle
olfr olfactory radiation
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

24

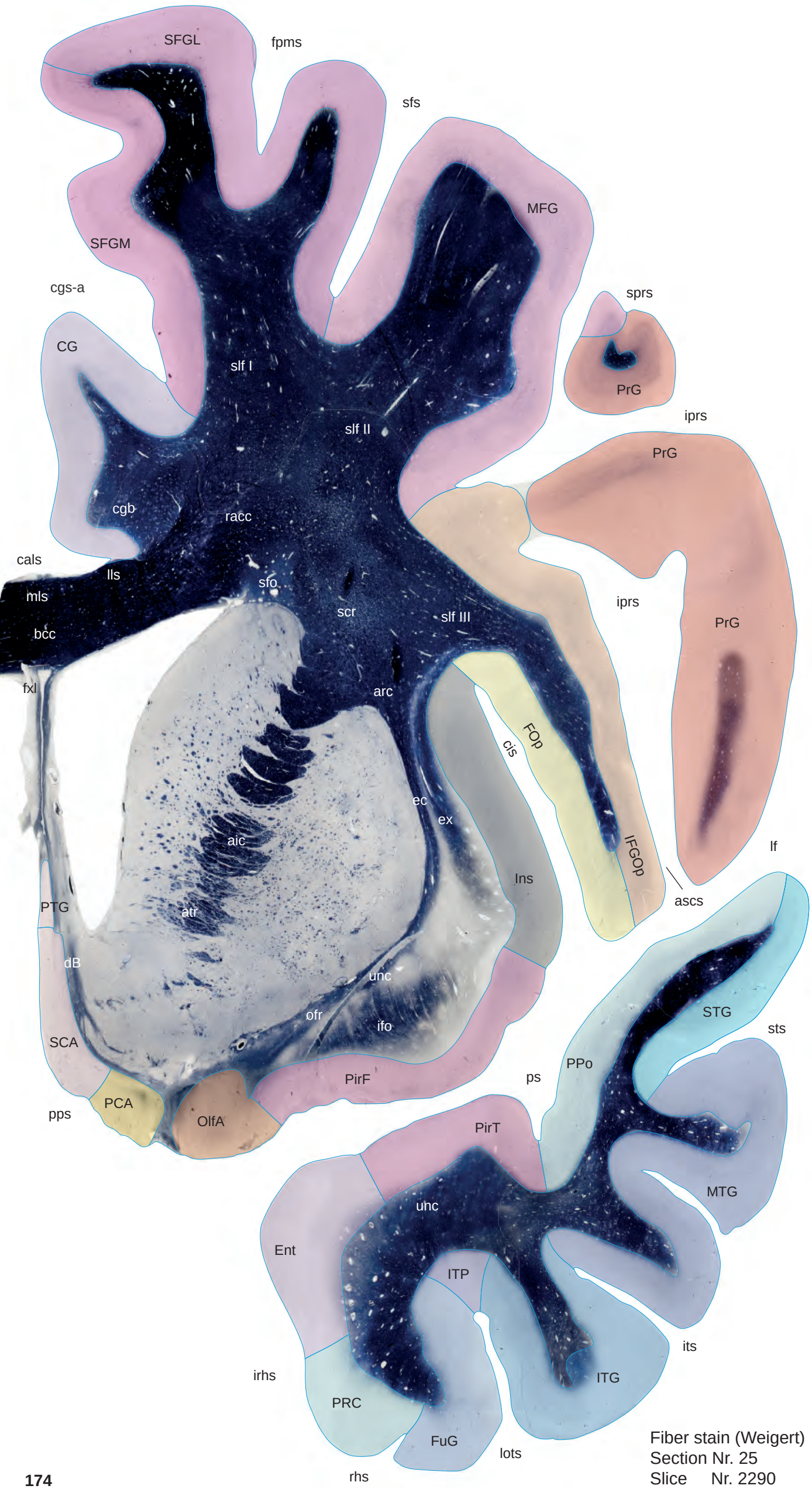
MNI: 7.18
ICL: -6.91
MCP: -21.65

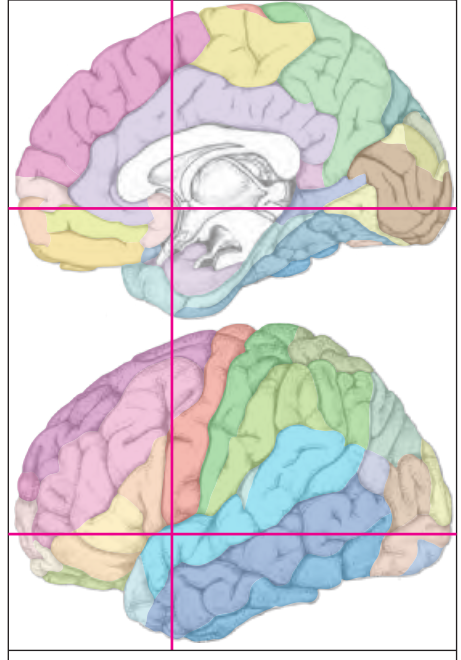


BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
apss anterior parolfactory sulcus, sup.branch
cals callosal sulcus
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
fpms frontal paramidline sulcus
FPu fundus region of putamen
IGr indusium griseum
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lls lateral longitudinal stria
lots lateral occipitotemporal sulcus
mls medial longitudinal stria
molf medial olfactory radiation
olf olfactory peduncle
olfr olfactory radiation
OP10,14 areas defined by Öngür et.al. (2003)
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
Pir piriform cortex
PPCl prepiriform claustrum
pps posterior parolfactory sulcus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
ps polas sulcus
Pu putamen
racc radiation of corpus callosum
rhs rhinal sulcus
SCS subcallosal stratum
sfs superior frontal sulcus
SptP septum pellucidum
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TPCl lateral temporopolar cortex
unc uncinate fc

Cortex: Gyri and Sulci





MNI Position y = 5.63 mm
AHB Position y = -5.36 mm

Fiber stain (Weigert)
Section Nr. 25
Slice Nr. 2290

Gyri

CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCA precommissural archicortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pps posterior parolfactory sulcus
ps polar sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus

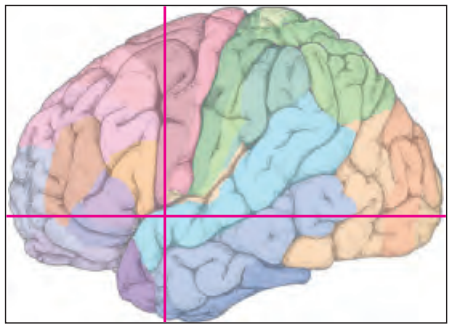
Fibers

aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
fxl fornix longus
ifo inferior fronto-occipital fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
ofr orbito-frontal fibers
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

25

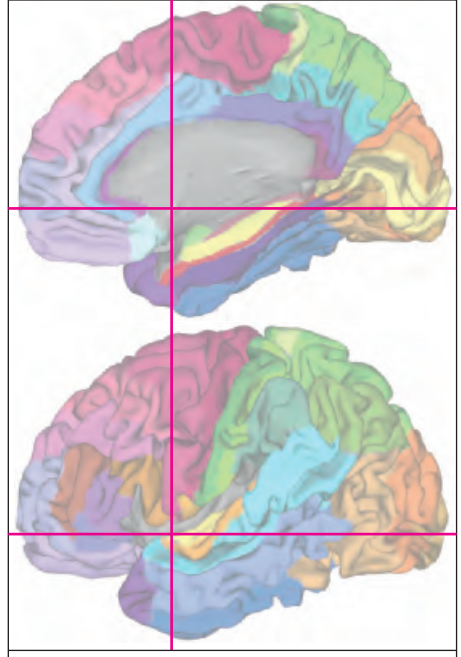
MNI: 5.63
ICL: -5.36
MCP: -20.10



BA1-52 Brodmann areas 1-52 (see p. 101)
*BA25 see p. 101

AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
AOP anterior olfactory n., post. p.
cals callosal sulcus
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
dB diagonal band (Bandeletta diagonalis)
ec external capsule
ex extreme capsule
FCd fundus region of caudate n.
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lots lateral occipitotemporal sulcus
LSV lateral septal n., ventral p.
molf medial olfactory radiation
OP10 area defined by Öngür et.al. (2003)
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
Pir piriform cortex
PPCl prepiriform claustrum
pps posterior parolfactory sulcus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
ps polas sulcus
Pu putamen
rhs rhinal sulcus
SCS subcallosal stratum
sfs superior frontal sulcus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TPCl lateral temporopolar cortex
Tu olfactory tubercle
unc uncinate fc
VCl ventral claustrum

Cell stain (Nissl):
Section Nr. 25
Slice Nr. 2285



MNI Position y = 5.77 mm
AHB Position y = -5.49 mm

Gyral Pattern

CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
ITP inferior temporopolar region
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCA precommissural archicortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SCA subcallosal area
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA25 area subgenualis
BA32 area cingularis anterior dorsalis
BA33 area praegenualis
BA44 area opercularis
OP10 area 10 (by Öngür et al. 2003)
OP_AON anterior olfactory nucleus (by Öngür et al. 2003)
OP_G gustatory cortex (by Öngür et al. 2003)
OP_I agranular insular cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pir piriform cortex
TPCl lateral temporopolar cortex
BA*1-52 Brodmann areas 1-52 extension of areas OP10-47

von Economo and Koskinas

FA precentral area
FB agranular frontal area
FC intermediate frontal area
FL parolfactory area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IBT postcentral insular area at temporal entrance
La precingulate agranular anterior limbic area
La2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24

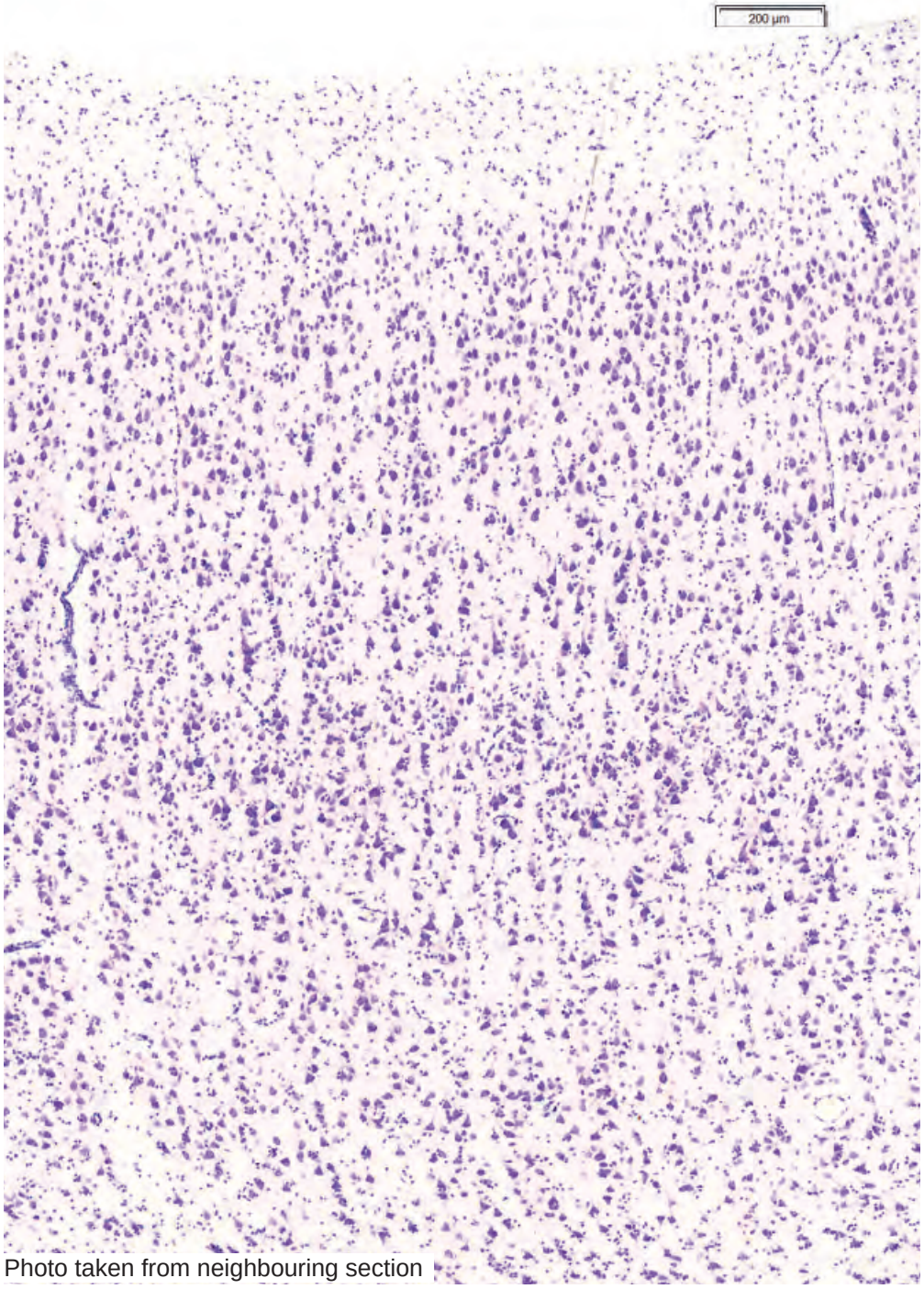
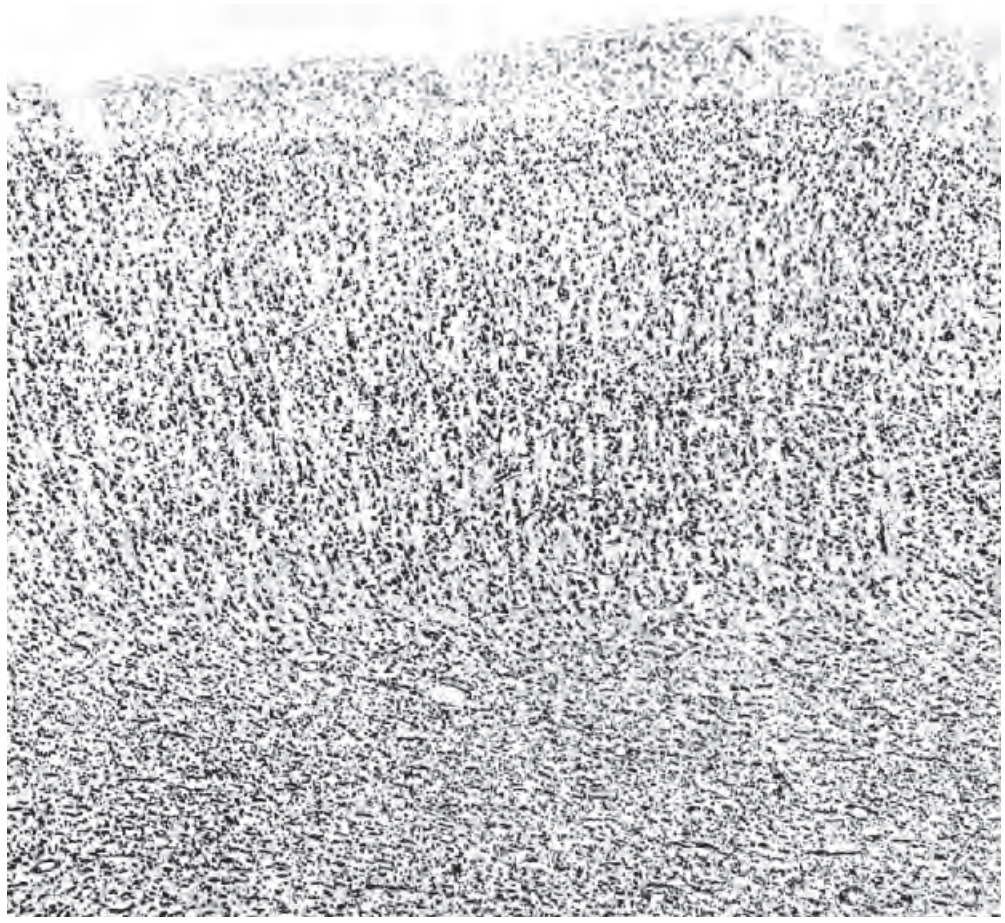
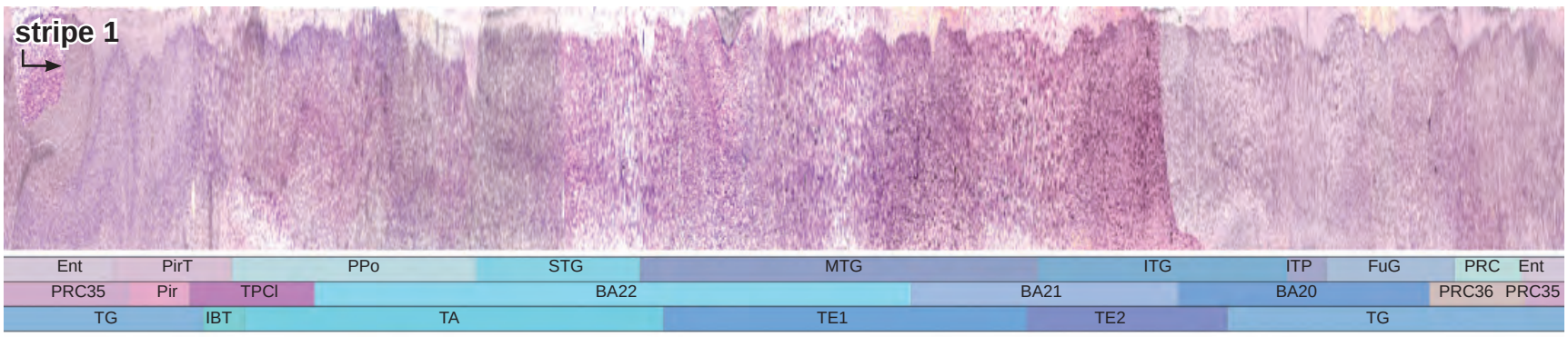


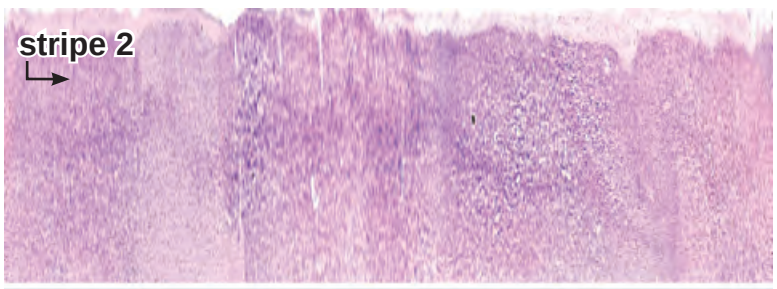
Photo taken from neighbouring section

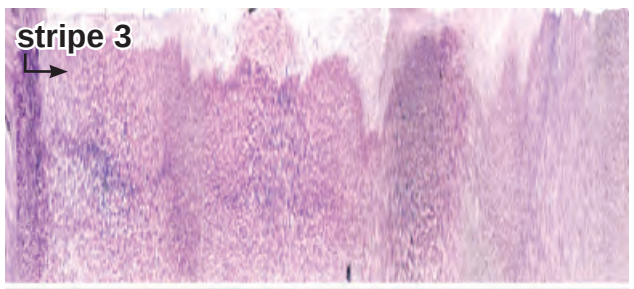


FDCop. Area frontalis intermedio agranularis opercularis.

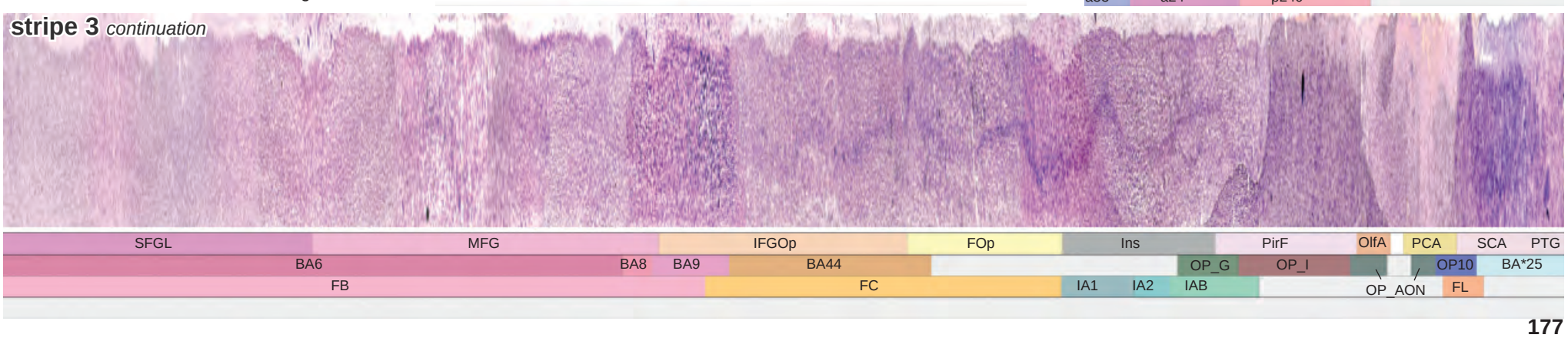
von Economo and Koskinas (1925) Plate XI (11)



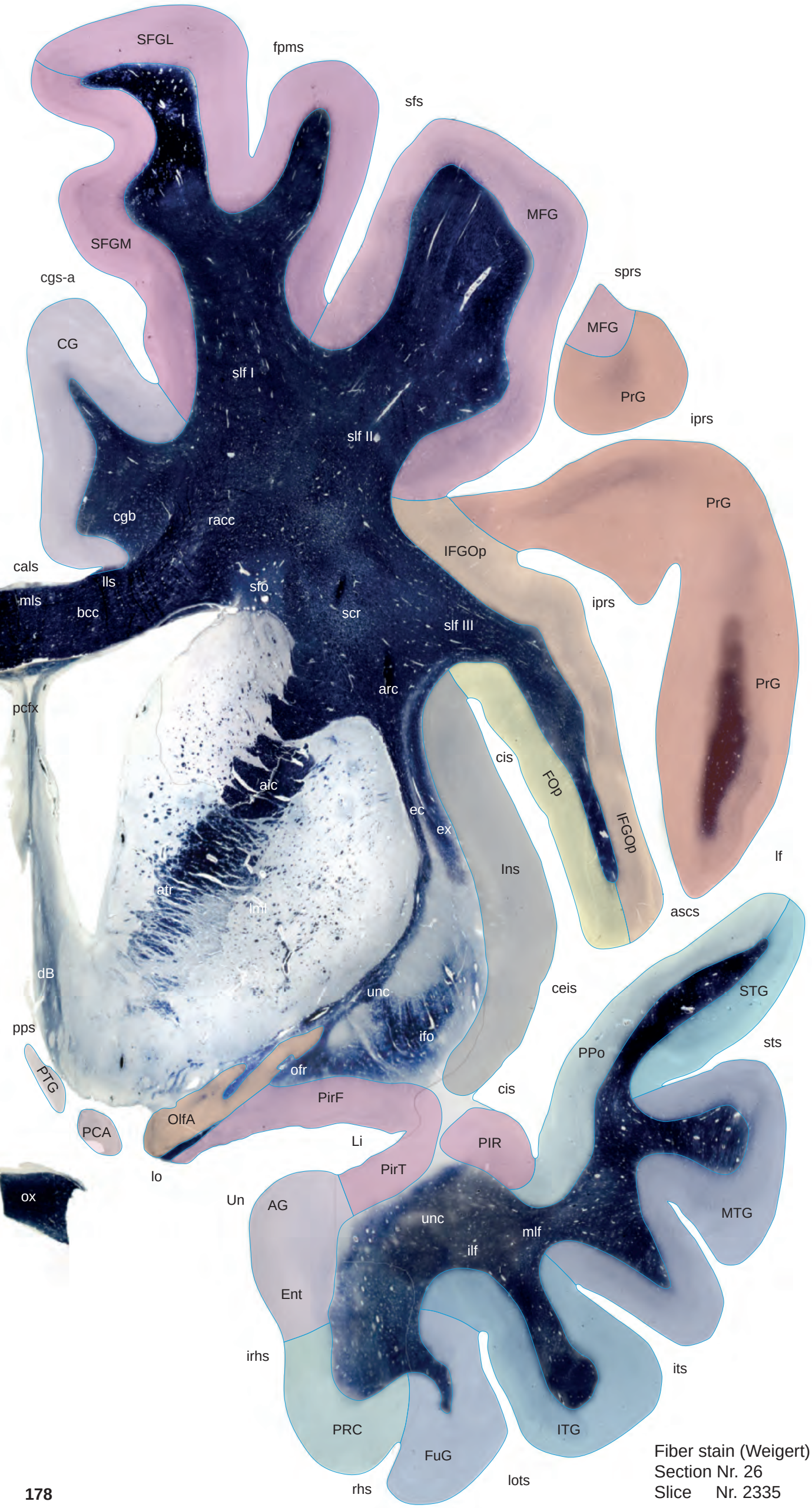


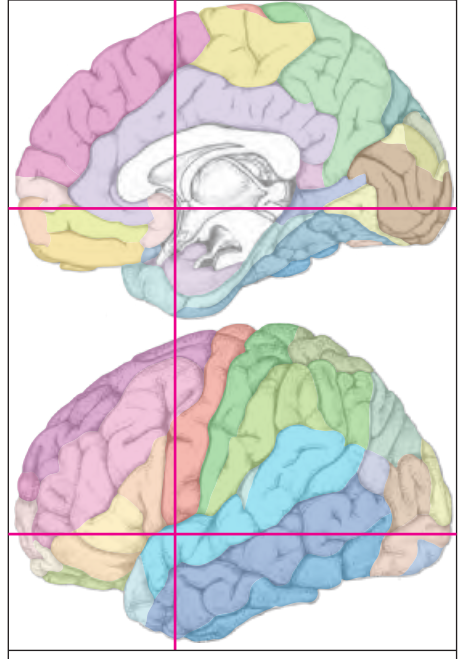


Gyral pattern
Brodmann areas
von Economo
Regions of Interest



Cortex: Gyri and Sulci





MNI Position y = 4.34 mm
AHB Position y = -4.15 mm

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PCA precommissural archicortex
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pps posterior parolfactory sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus

Fibers

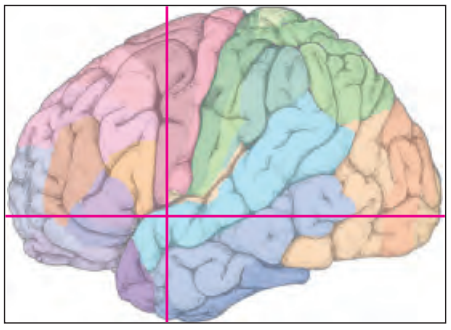
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
pcfx precommissural fornix
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 26
Slice Nr. 2335

Cortex: Brodmann Areas

26

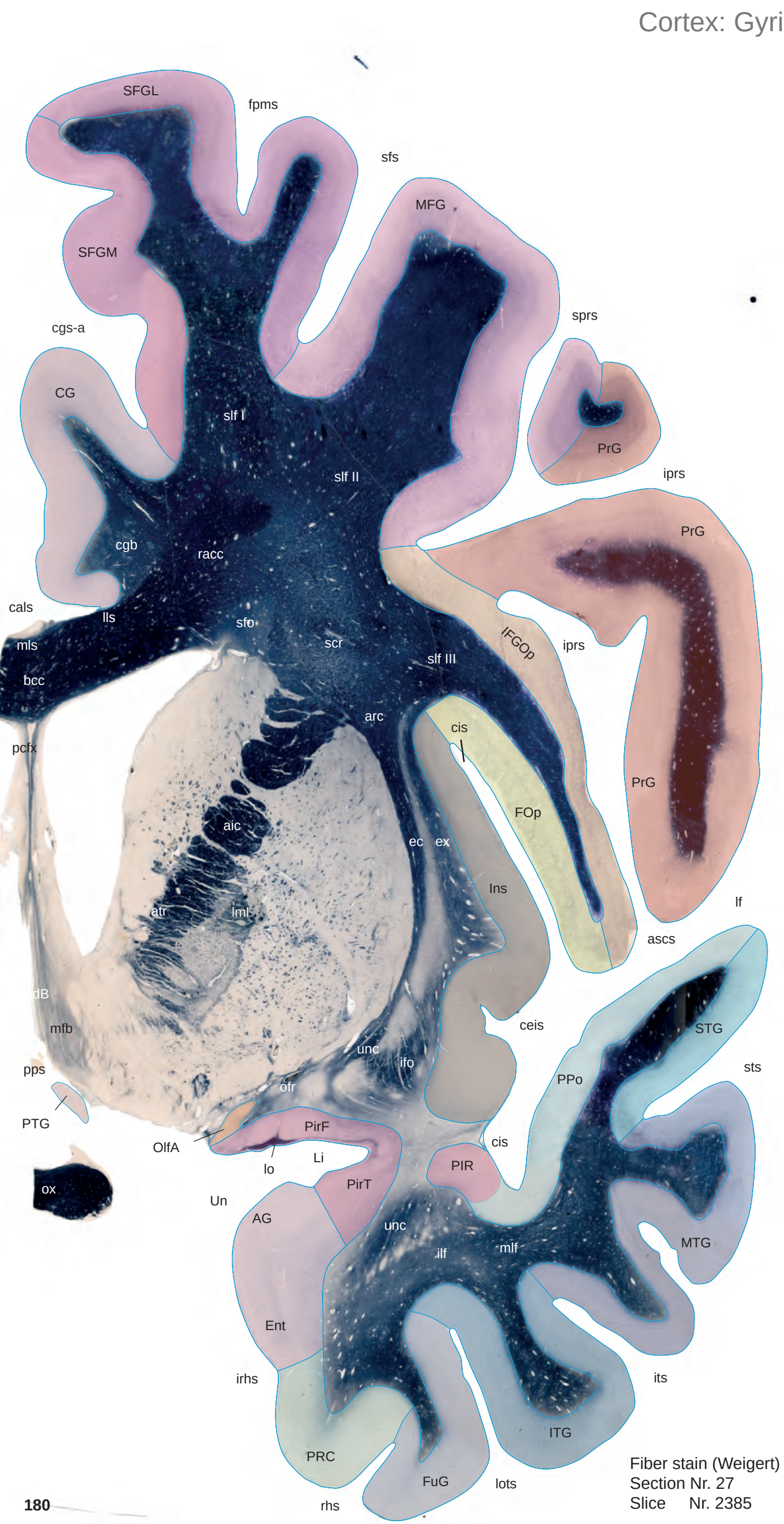
MNI: 4.34
ICL: -4.15
MCP: -18.89

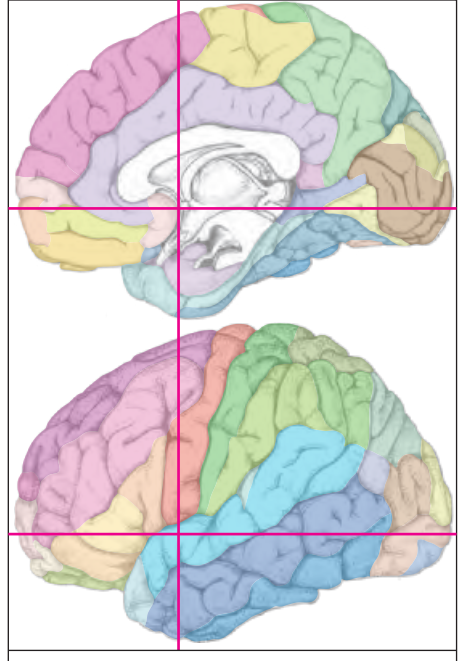


BA1-52 Brodmann areas 1-52 (see p. 101)

AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
ec external capsule
EC entorhinal cortex
EGP external globus pallidus
ex extreme capsule
FCd fundus region of caudate n.
fpms frontal paramidline sulcus
FPu fundus region of putamen
GTI great terminal island
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
Li limen insulae
lml lateral medullary lamina of the globus pallidus
lots lateral occipitotemporal sulcus
LT lamina terminalis
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PAC periamygdaloid cortex
PCA precommissural archicortex
pcfx precommissural fornix
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pu putamen
rhs rhinal sulcus
SCA subcallosal area
SCGP supracapsular part of globus pallidus
SCS subcallosal stratum
sfs superior frontal sulcus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
Tu olfactory tubercle
TuTI tubercular terminal islands
unc uncinate fc
VCl ventral claustrum

Cortex: Gyri and Sulci





MNI Position y = 3.12 mm
AHB Position y = -2.81 mm

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pps posterior parolfactory sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus

Fibers

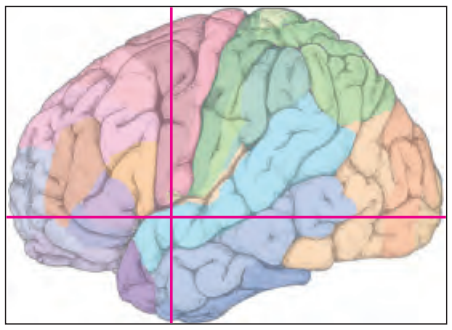
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
pcfx precommissural fornix
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 27
Slice Nr. 2385

Cortex: Brodmann Areas

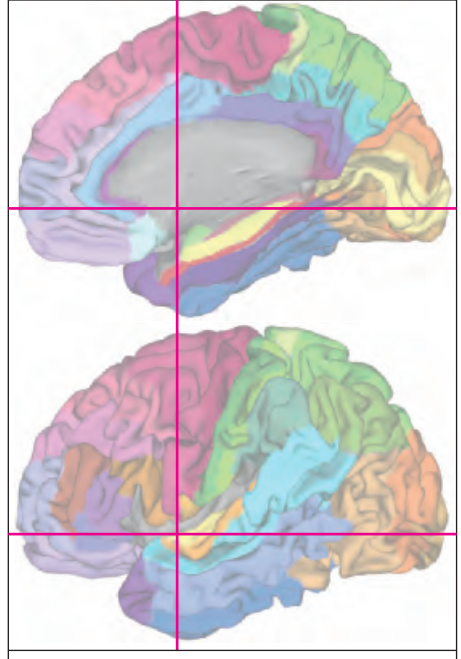
27

MNI: 3.12
ICL: -2.81
MCP: -17.55



BA1-52 Brodmann areas 1-52 (see p. 101)

AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
ec external capsule
EC entorhinal cortex
EGP external globus pallidus
ex extreme capsule
FCd fundus region of caudate n.
fpms frontal paramidline sulcus
FPu fundus region of putamen
GTI great terminal island
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
Li limen insulae
lml lateral medullary lamina of the globus pallidus
lots lateral occipitotemporal sulcus
LT lamina terminalis
OlfA olfactory area
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
OP I agranular insular cortex (mapped from Öngür et. al. 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PAC periamygdaloid cortex
PCA precommissural archicortex
pcfx precommissural fornix
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PTG paraterminal gyrus
Pu putamen
rhs rhinal sulcus
SCA subcallosal area
SCGP supracapsular p. of globus pallidus
SCS subcallosal stratum
sfs superior frontal sulcus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
Tu olfactory tubercle
TuTI tubercular terminal islands
unc uncinate fc
VCl ventral claustrum



MNI Position y = 3.52 mm
AHB Position y = -3.35 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
OlfA olfactory area
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PTG paraterminal gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA9 area frontalis granularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA44 area opercularis
EC external capsule
OP_G gustatory cortex (by Öngür et al. 2003)
OP_I agranular insular cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pir piriform cortex

von Economo and Koskinas

FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24

Cell stain (Nissl):
Section Nr. 27
Slice Nr. 2365

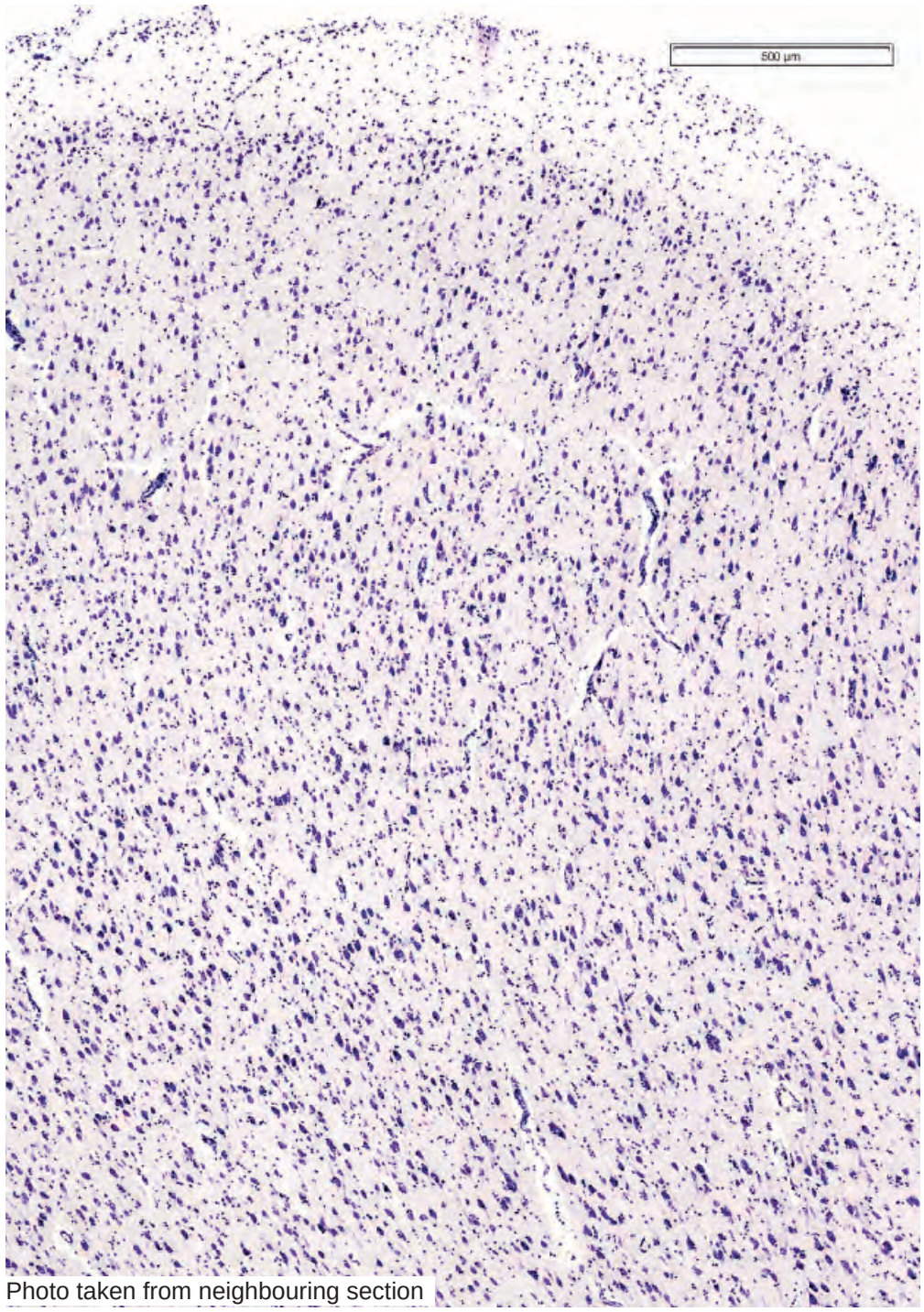
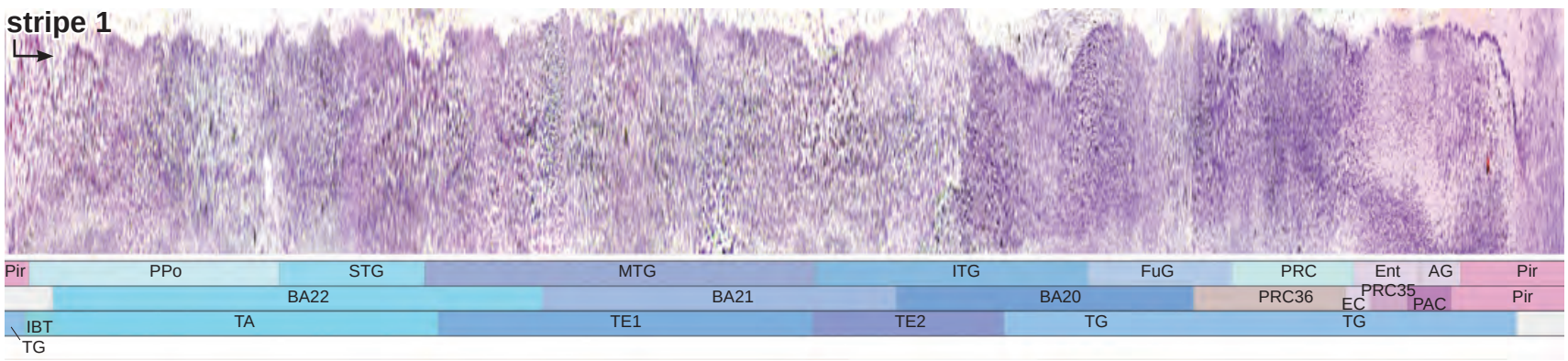
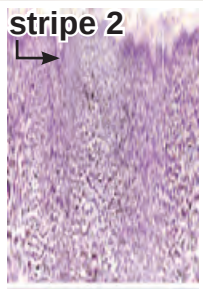


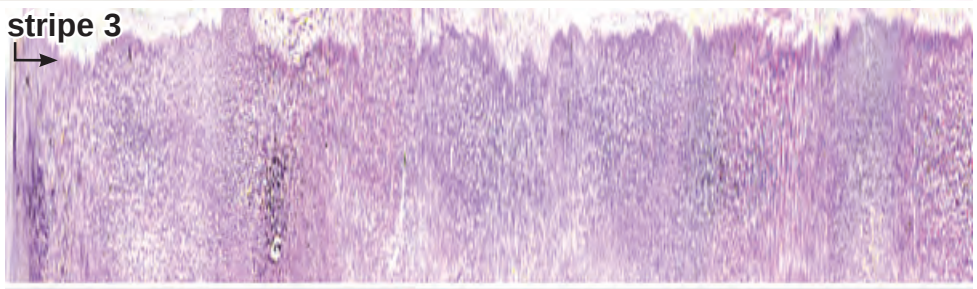
Photo taken from neighbouring section

TGa Area temporopolaris agranularis.

von Economo and Koskinas (1925) Plate XCIX (99)

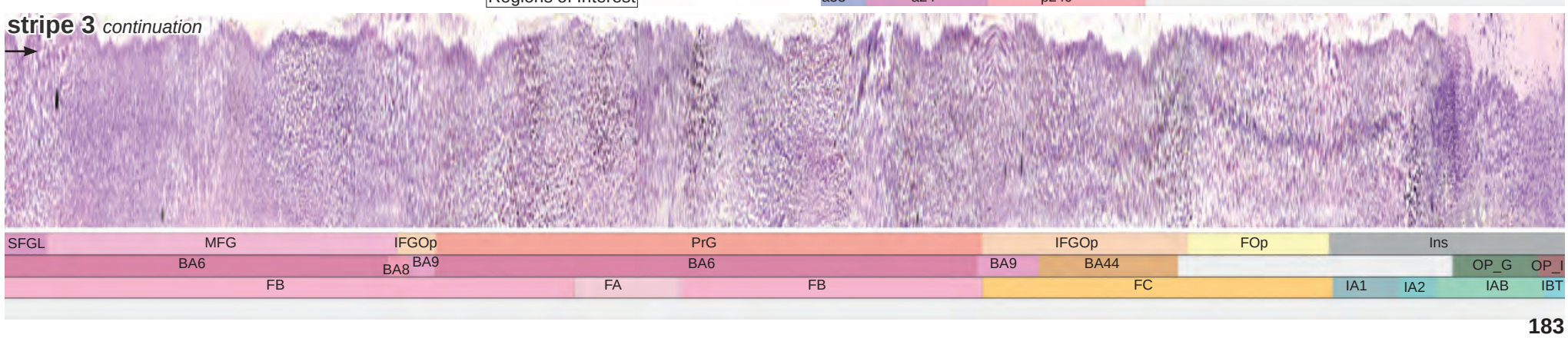






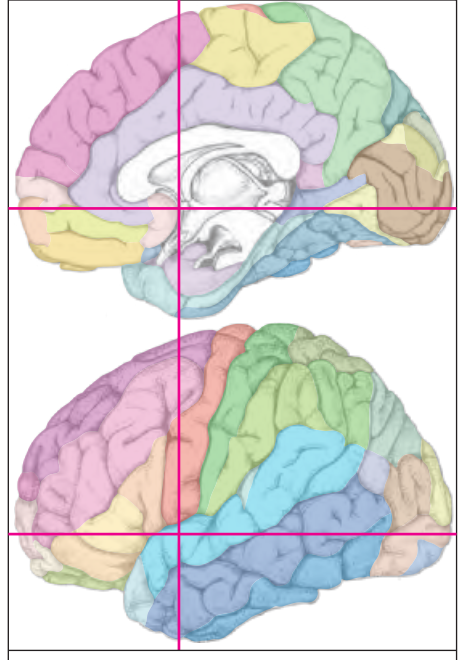
Gyral pattern	MFG	PrG	MFG
Brodmann areas	BA6		
von Economo	FA	FB	FA
Regions of Interest			

CG	SFGM	SFGL
BA24	BA32	BA6
la2	la	FB
a33‘	a24‘	p24c‘



Cortex: Gyri and Sulci

Fiber stain (Weigert)
Section Nr. 28
Slice Nr. 2391



MNI Position y = 2.53 mm
AHB Position y = -2.65 mm

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus

Sulci

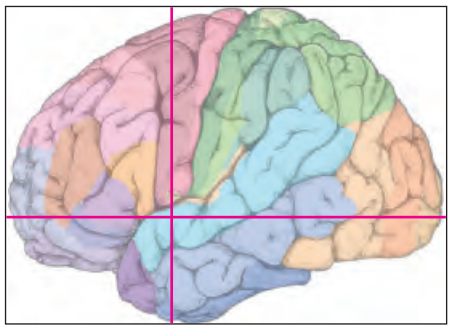
ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

Fibers

ac anterior commissure
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
dB diagonal band (Broca)
ec external capsule
ex extreme capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
pcfx precommissural fornix
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
unc uncinate fascicle

Cortex: Brodmann Areas

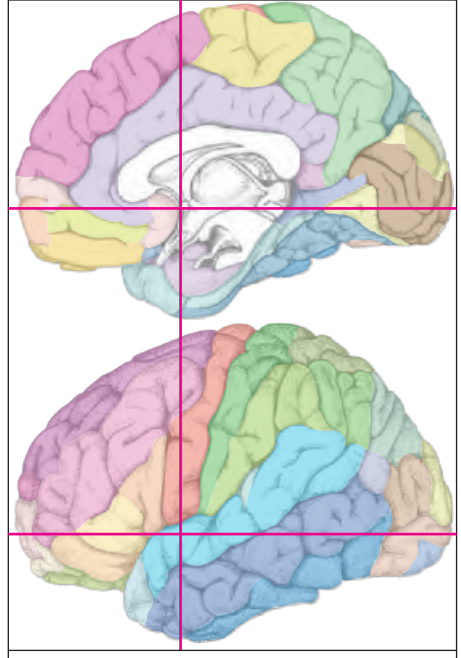
MNI: 2.53
ICL: -2.65
MCP: -17.39



BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aic anterior limb of the internal capsule
BSTC bed n. of the stria terminalis, central division
BSTL bed n. of the stria terminalis, lateral division
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
ec external capsule
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
ex extreme capsule
FCd fundus region of caudate n.
fpms frontal paramidline sulcus
FPu fundus region of putamen
GTI great terminal island
IGr indusium griseum
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
Li limen insulae
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSV lateral septal n., ventral p.
LT lamina terminalis
mfb medial forbrain bundle
mls medial longitudinal stria
OlfA olfactory area
OP AON anterior olfactory nucleus (mapped from Öngür et. al. 2003)
OP G gustatory cortex (mapped from Öngür et. al. 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pcfx precommissural fornix
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pu putamen
rhs rhinal sulcus
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
SCTI subcaudate terminal island
SFi septofimbrial n.
sfs superior frontal sulcus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
Tu olfactory tubercle
TuTI tubercular terminal islands
unc uncinate fc
VCl ventral claustrum
VDB vert. limb of the diagonal band

Cortex: Gyri and Sulci



MNI Position y = 2.14 mm
AHB Position y = -2.03 mm

Fiber stain (Weigert)
Section Nr. 29
Slice Nr. 2414

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus

Sulci

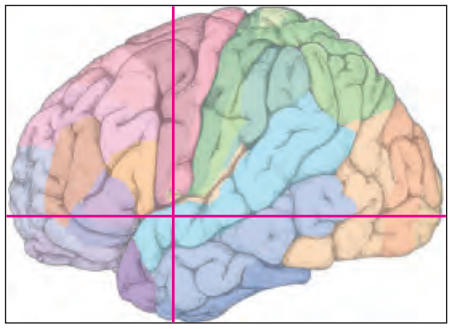
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus

Fibers

ac anterior commissure
aco anterior commissure, anterior limb
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
ex extreme capsule
fxl fornix longus
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
st stria terminalis
unc uncinate fascicle

Cortex: Brodmann Areas

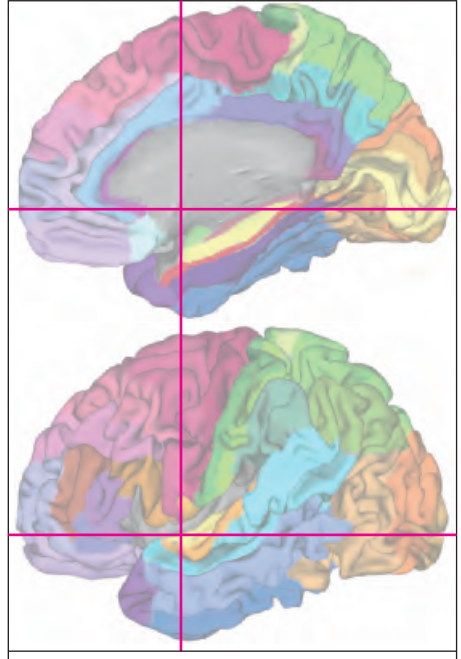
MNI: 2.14
ICL: -2.03
MCP: -16.77



BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
AcC accumbens n., central p.
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aco anterior commissure, anterior limb
aic anterior limb of the internal capsule
BA1-52 Brodman areas 1-52 (see plate Nr. 1)
BSTC bed n. of the stria terminalis, central division
BSTLJ bed n. of the stria terminalis, lateral division, juxtacapsular p.
BSTM bed n. of the stria terminalis, medial division
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
ec external capsule
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
ex extreme capsule
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
GTI great terminal island
IGr indusium griseum
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
Li limen insulae
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
LT lamina terminalis
OP G gustatory cortex (mapped from Öngür et.al., 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pcfx precommissural fornix
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pu putamen
rhs rhinal sulcus
SB striatal cell bridge
scal subcallosal fc
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
SFi septofimbrial n.
sfs superior frontal sulcus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
TCl temporal claustrum
Tu olfactory tubercle
TuTI tubercular terminal islands
Un uncus
unc uncinate fc
VCl ventral claustrum
VDB vert. limb of the diagonal band
VGP ventral globus pallidus

Cell stain (Nissl):
Section Nr. 29
Slice Nr. 2420



MNI Position y = 1.97 mm
AHB Position y = -1.87 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
Li limen insulae
MFG middle frontal gyrus
MTG middle temporal gyrus
PIR parainsular region
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus

Brodmann Areas

BA6 area frontalis agranularis
BA8 area frontalis intermedia
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA44 area opercularis
ELR entorhinal cortex, lateral rostral subfield
OP_G gustatory cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
Pir piriform cortex

von Economo and Koskinas

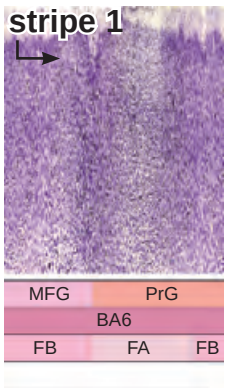
FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

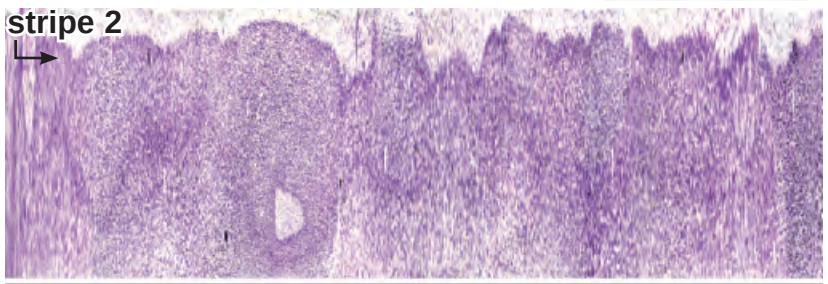
Regions of Interest

B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24

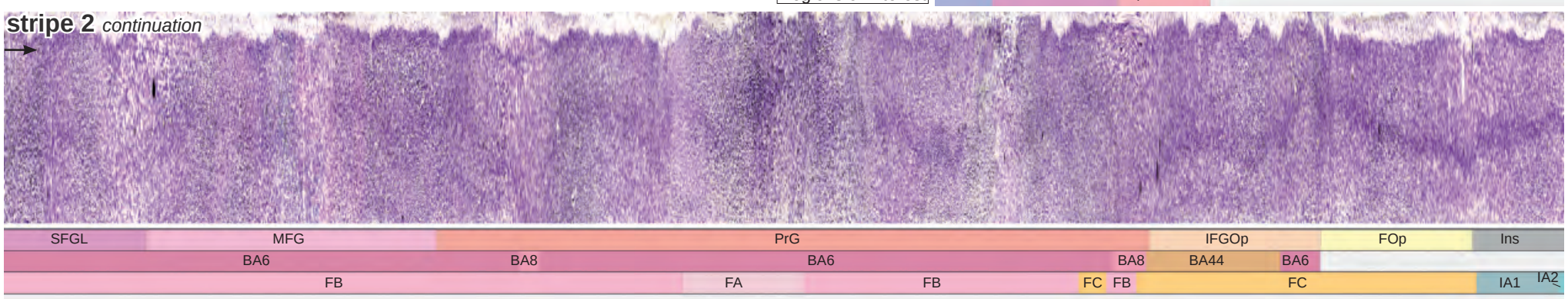
FB Area frontalis agranularis.

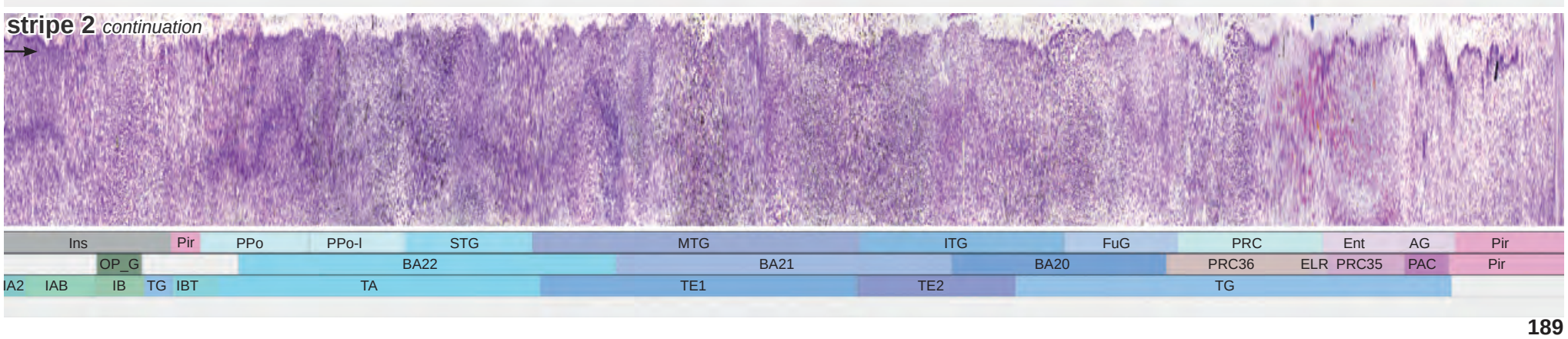
von Economo and Koskinas (1925) Plate VII (7)



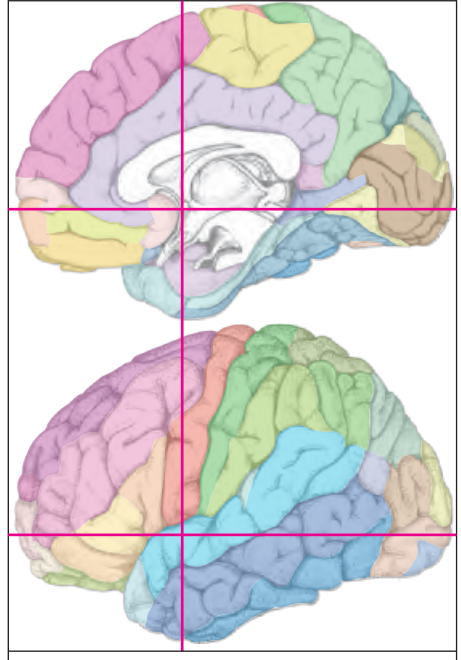


Gyral pattern
Brodmann areas
von Economo
Regions of Interest





Cortex: Gyri and Sulci



MNI Position y = 1.41 mm
AHB Position y = -1.39 mm

Fiber stain (Weigert)
Section Nr. 30
Slice Nr. 2438

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

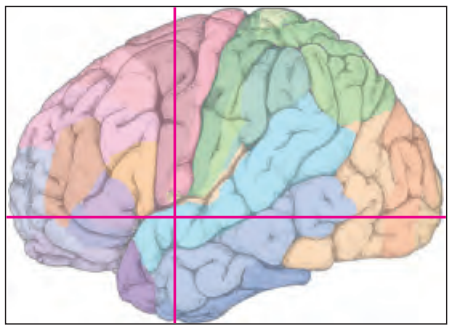
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

Fibers

ac anterior commissure
aco anterior commissure, anterior limb
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
ex extreme capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
pcfx precommissural fornix
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
st stria terminalis
unc uncinate fascicle

Cortex: Brodmann Areas

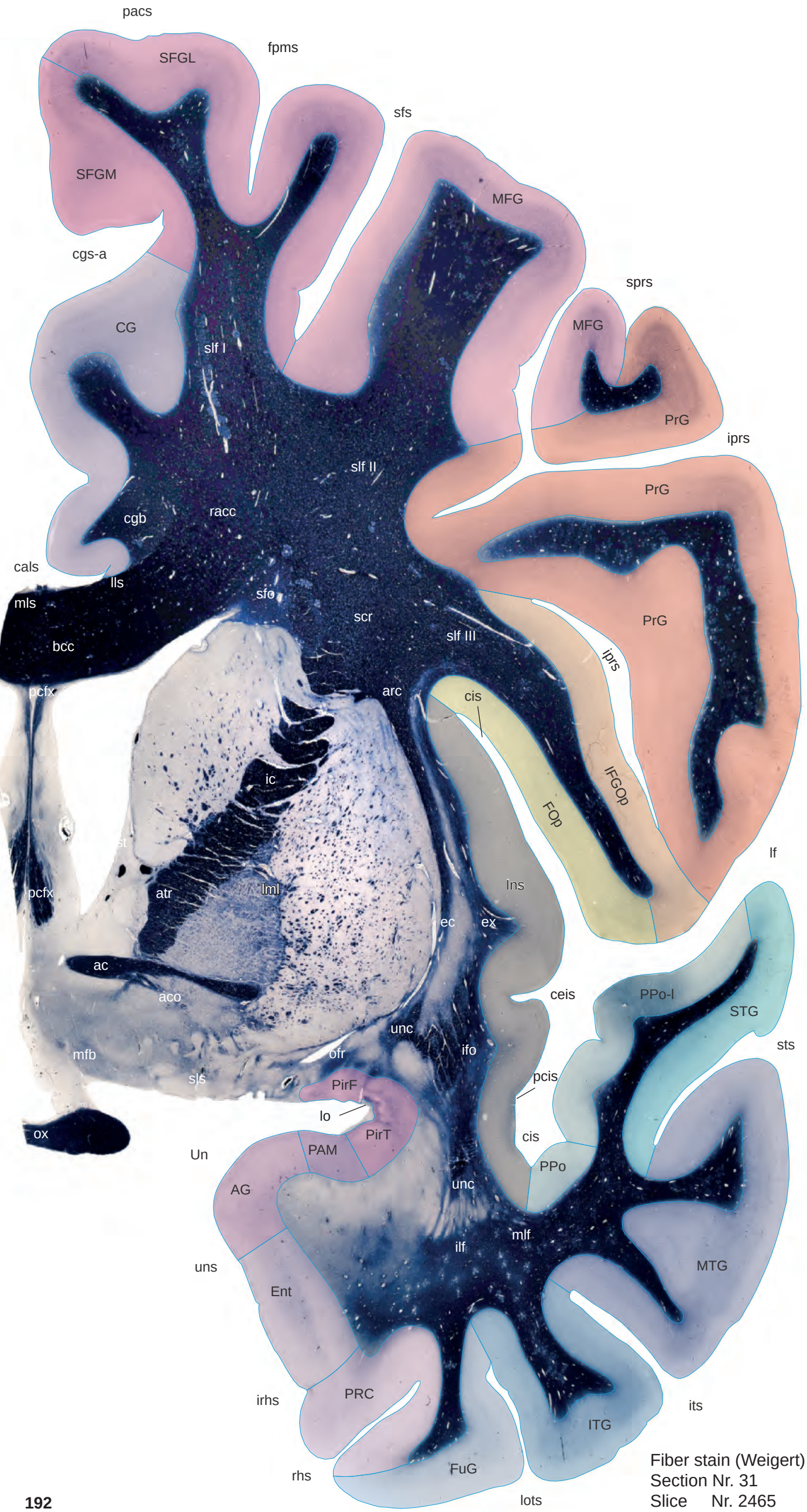
MNI: 1.41
ICL: -1.39
MCP: -16.13

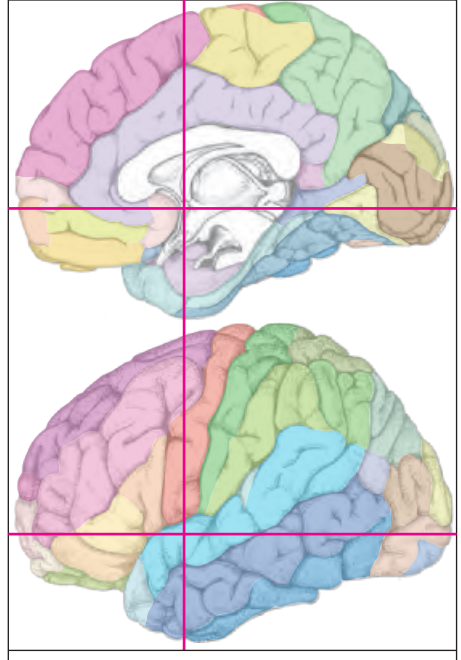


BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
AcC accumbens n., central p.
AcM accumbens n., medial p.
aco anterior commissure, anterior limb
aic anterior limb of the internal capsule
AVPe anteroventral periventricular hypoth. n.
BSTC bed n. of the stria terminalis, centra division
BSTL bed n. of the stria terminalis, lateral division
BSTM bed n. of the stria terminalis, medial division
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
DPeH dorsal periventricular hypothalamic n.
ec external capsule
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
ex extreme capsule
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
GTI great terminal island
HDB horizontal limb of the diagonal band
IGr indusium griseum
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
Li limen insulae
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
MPO medial preoptic n.
MPO medial preoptic n., medial p.
OP G gustatory cortex (mapped from Öngür et.al., 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PaAP paraventricular hypothalamic n., anterior parvicellular p.
PAC periamygdaloid cortex
PACl preamygdalar claustrum
PAM periamygdaloid cortex
pcfx precommissural fornix
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PPCl prepiriform claustrum
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
scal subcallosal fc
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
SFi septofimbrial n.
sfs superior frontal sulcus
SO supraoptic n.
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
TS triangular septal n.
tsv thalamostriate vein
Tu olfactory tubercle
TuTI tubercular terminal islands
Un uncus
unc uncinate fc
VCl ventral claustrum
VDB vertical limb of the diagonal band
VGP ventral globus palidus

Cortex: Gyri and Sulci





MNI Position y = 0.68 mm
AHB Position y = -0.67 mm

Fiber stain (Weigert)
Section Nr. 31
Slice Nr. 2465

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAM periamygdaloid cortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

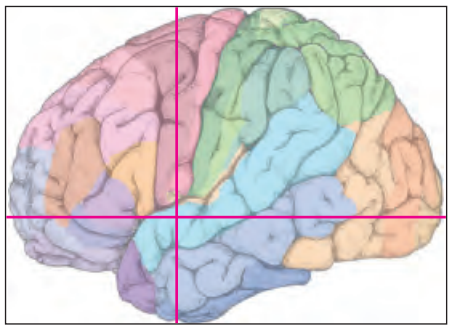
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

Fibers

ac anterior commissure
aco anterior commissure, anterior limb
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
ex extreme capsule
ic internal capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
ofr orbito-frontal fibers
ox optic chiasma
pcfx precommissural fornix
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
st stria terminalis
unc uncinate fascicle

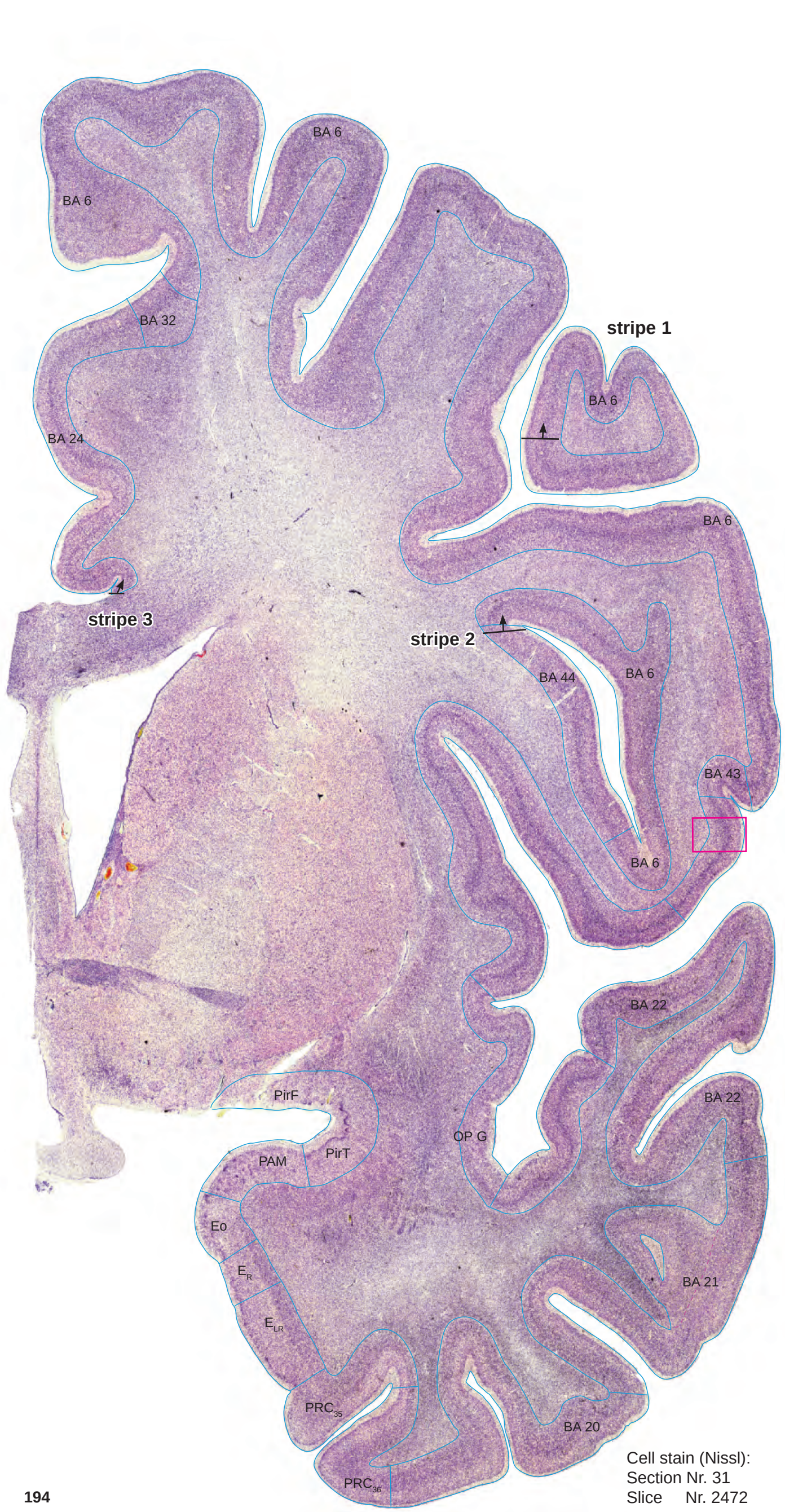
Cortex: Brodmann Areas

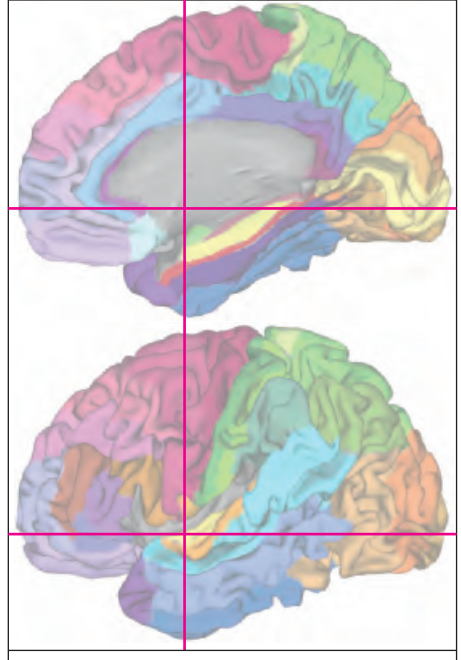
MNI: 0.68
ICL: -0.67
MCP: -15.41



BA1-52 Brodmann areas 1-52 (see p. 101)

AB access. basal amygdaloid n.
ac anterior commissure
AcL accumbens n., lateral p.
AcM accumbens n., medial p.
aco anterior commissure, anterior limb
ADB n. of the diagonal band, angular p.
AG ambiens gyrus
aic anterior limb of the internal capsule
AVPe anteroventral periventricular hypothal. n.
BC basal n., compact part
BSTC bed n. of the stria terminalis, central div.
BSTL bed n. of the stria terminalis, lateral div.
BSTM bed n. of the stria terminalis, medial div.
cc corpus calosum
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior part
cis circular sulcus
CoCl compact insular claustrum
DiCl diffuse insular claustrum
DPeH dorsal periventricular hypothalamic n.
ec external capsule
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
Eo entorhinal cortex, olfactory subfield
ER entorhinal cortex, rostral subfield
ex extreme capsule
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
fx fornix (column and body)
GTI great terminal island
HDB horizontal limb of the diagonal band
ilf inferior longitudinal fc
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
La lateral amygdaloid n.
lf lateral (Sylvian) fissure
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
mfb medial forbrain bundle
MnPO median preoptic n.
MPO medial preoptic n.
OP G gustatory cortex (mapped from Öngür et.al., 2003)
ox optic chiasma
P3V preoptic recess of third ventr.
PaAP paraventricular hypothalamic n., ant. parvicellular p.
PACl preamygdalar claustrum
pacs paracentral sulcus
PAM periamygdaloid cortex
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
scal subcallosal fc
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
SFi septofimbrial n.
sfs superior frontal sulcus
SO supraoptic n.
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
TS triangular septal n.
tsv thalamostriate vein
Tu olfactory tubercle
TuTI tubercular terminal islands
unc uncinate fc
unn uncal notch
VCl ventral claustrum
VGP ventral globus palidus





MNI Position y = 0.51 mm
AHB Position y = -0.48 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAM periamygdaloid cortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Brodmann Areas

BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA32 area cingularis anterior dorsalis
BA43 area subcentralis
BA44 area opercularis
Hi hippocampus
OP_G gustatory cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

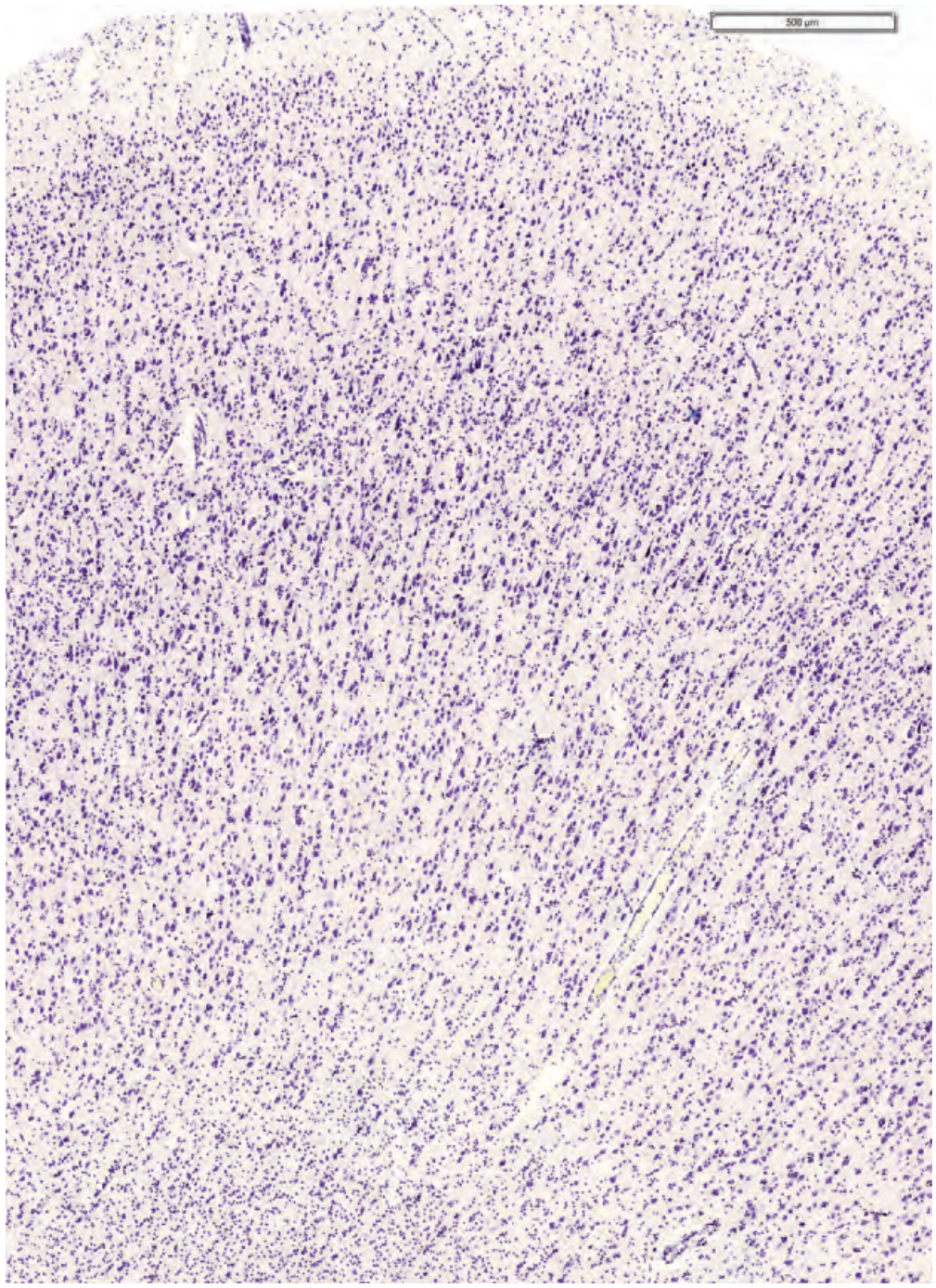
von Economo and Koskinas

FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

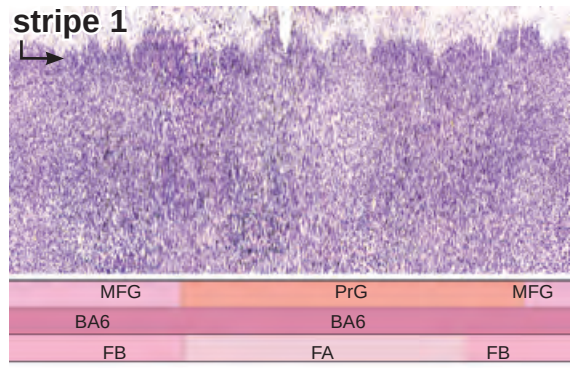
B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24
p24‘ anterior division of BA24

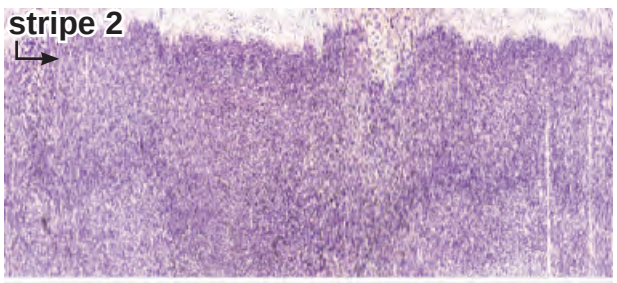
Cell stain (Nissl):
Section Nr. 31
Slice Nr. 2472

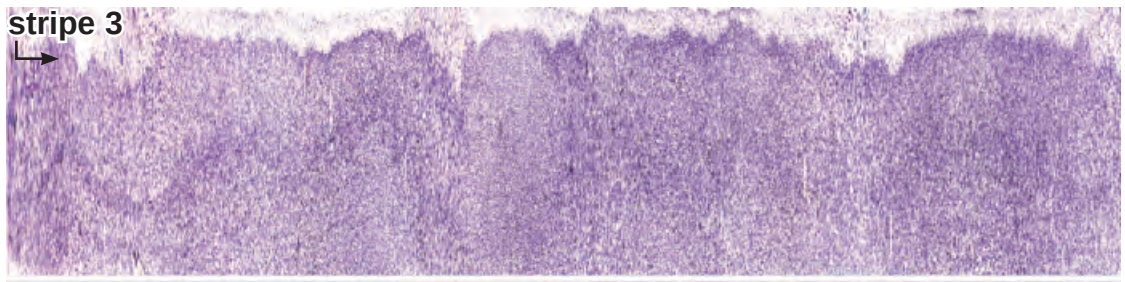


FB(C)op. Area frontalis (intermedio-) agranularis in operculo.

von Economo and Koskinas (1925) Plate X (10)

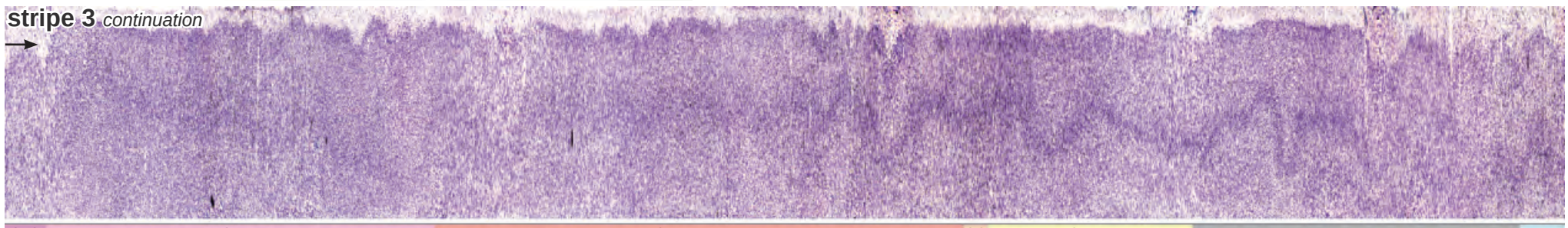




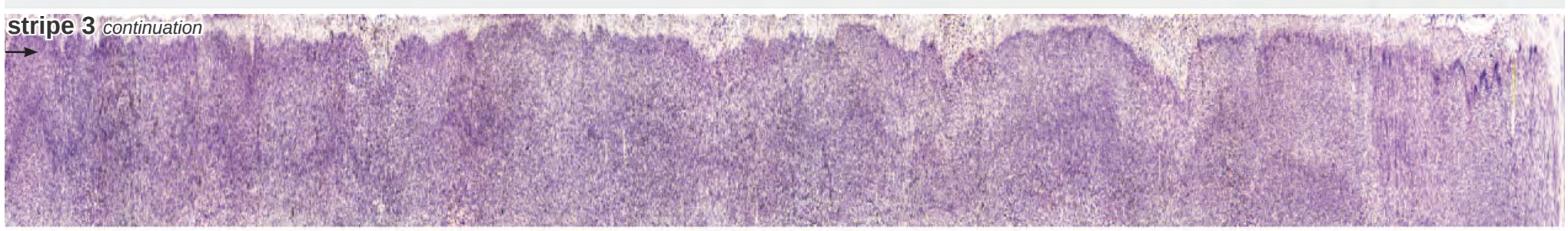


Gyral pattern: PrG | IFGOp | PrG
Brodmann areas: BA6 | BA44
von Economo: FB | FC | FB
Regions of Interest

CG | SFGM | SFGL
BA24 | BA32 | BA6
Ia2 | Ia | FB
a33‘ | p24‘ | a24‘ | p24c‘

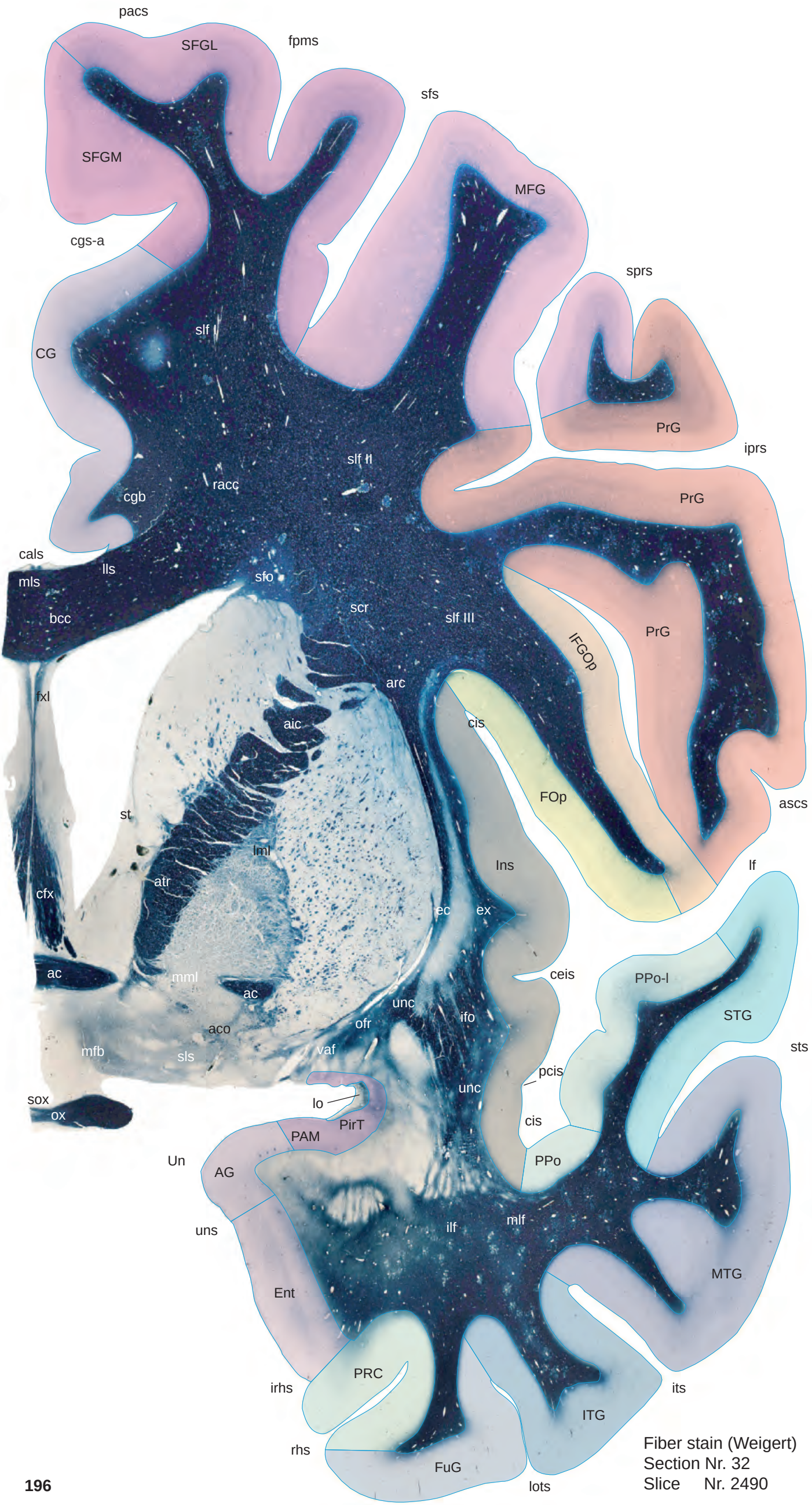


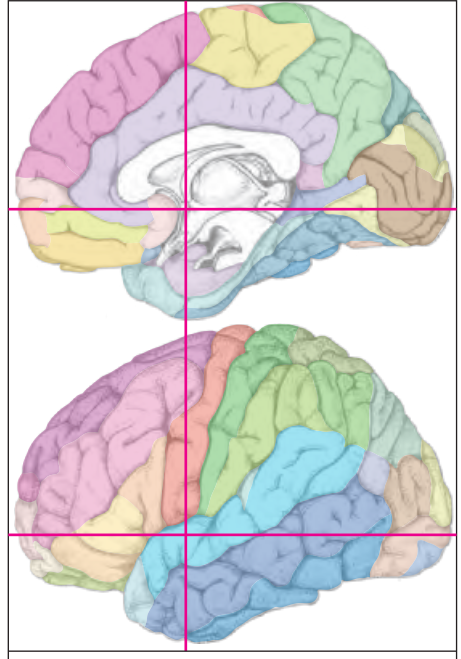
SFGL | MFG | PrG | IFGOp | FOp | Ins | PPo
BA6 | BA43 | BA6 | OP_G
FB | FA | FB | FC | IA1 | IA2 | IAB | IB | IBT | TA



PPo-I | STG | MTG | ITG | FuG | PRC | Ent
BA22 | BA21 | BA20 | PRC36 | PRC35 | Hi
TA | TE1 | TE2 | TG

Cortex: Gyri and Sulci





MNI Position y = 0.00 mm
AHB Position y = 0.00 mm

Fiber stain (Weigert)
Section Nr. 32
Slice Nr. 2490

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAM periamygdaloid cortex
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

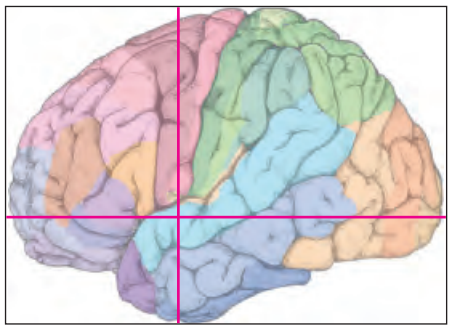
Fibers

ac anterior commissure
aco anterior commissure, anterior limb
aic anterior limb of the internal capsule
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cfx column of fornix
cgb cingulum bundle
ec external capsule
ex extreme capsule
fxl fornix longus
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
ofr orbito-frontal fibers
ox optic chiasma
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
sox supraoptic commissure
st stria terminalis
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Cortex: Brodmann Areas

32

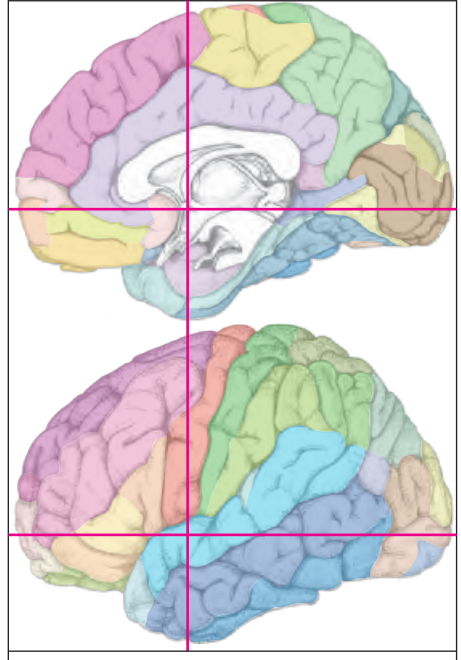
MNI: 0.00
ICL: 0.00
MCP: -14.74



BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
ac anterior commissure
AG ambiens gyrus
BC basal n., compact part
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
BSTC bed n. of the stria terminalis, central div.
BSTL bed n. of the stria terminalis, lateral div.
BSTM bed n. of the stria terminalis, medial div.
BSTV bed n. of the stria terminalis, ventral div.
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
CoCl compact insular claustrum
db diagonal band (Bandeletta diagonalis)
DiCl diffuse insular claustrum
DPeH dorsal periventricular hypothalamic n.
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
Eo entorhinal cortex, olfactory subfield
ER entorhinal cortex, rostral subfield
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
fx fornix (column and body)
GTI great terminal island
ic internal capsule
IGr indusium griseum
ilf inferior longitudinal fc
InfS infundibular stalk
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
La lateral amygdaloid n.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of the glob. pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
mfb medial forbrain bundle
mml medial medullary lamina of glob. pallidus
MPO medial preoptic n.
MPOL medial preoptic nucleus, lateral p.
MS medial septal n.
OP G gustatory cortex (mapped from Öngür et.al., 2003)
opt optic tract
ox optic chiasma
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaMC paraventricular n., magnocellular p.
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
scal subcallosal fc
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
sfs superior frontal sulcus
SGl substantia gliosa
SO supraoptic n.
sprs superior precentral sulcus
SSTl substriatal terminal island
sts superior temporal sulcus
sv septal vein
SxD sexual dimorphic n.
TCl temporal claustrum
TS triangular septal n.
tsv thalamostriate vein
Tu olfactory tubercle
TuTl tubercular terminal islands
unc uncinate fc
Unn uncinate nucleus
VCl ventral claustrum
VGP ventral globus palidus

Cortex: Gyri and Sulci



MNI Position y = -0.79 mm
AHB Position y = 0.70 mm

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAM periamygdaloid cortex
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

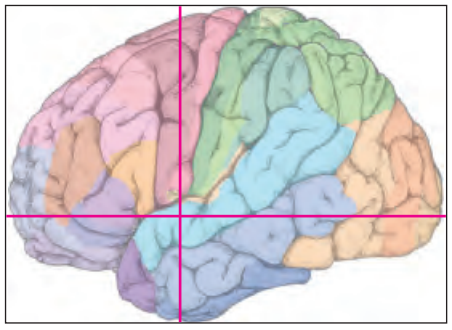
Fibers

ac anterior commissure
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cfx column of fornix
cgb cingulum bundle
ec external capsule
ex extreme capsule
fx fornix (column and body)
fxl fornix longus
ic internal capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
sox supraoptic commissure
st stria terminalis
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Substance P
Section Nr. 33
Slice Nr. 2492

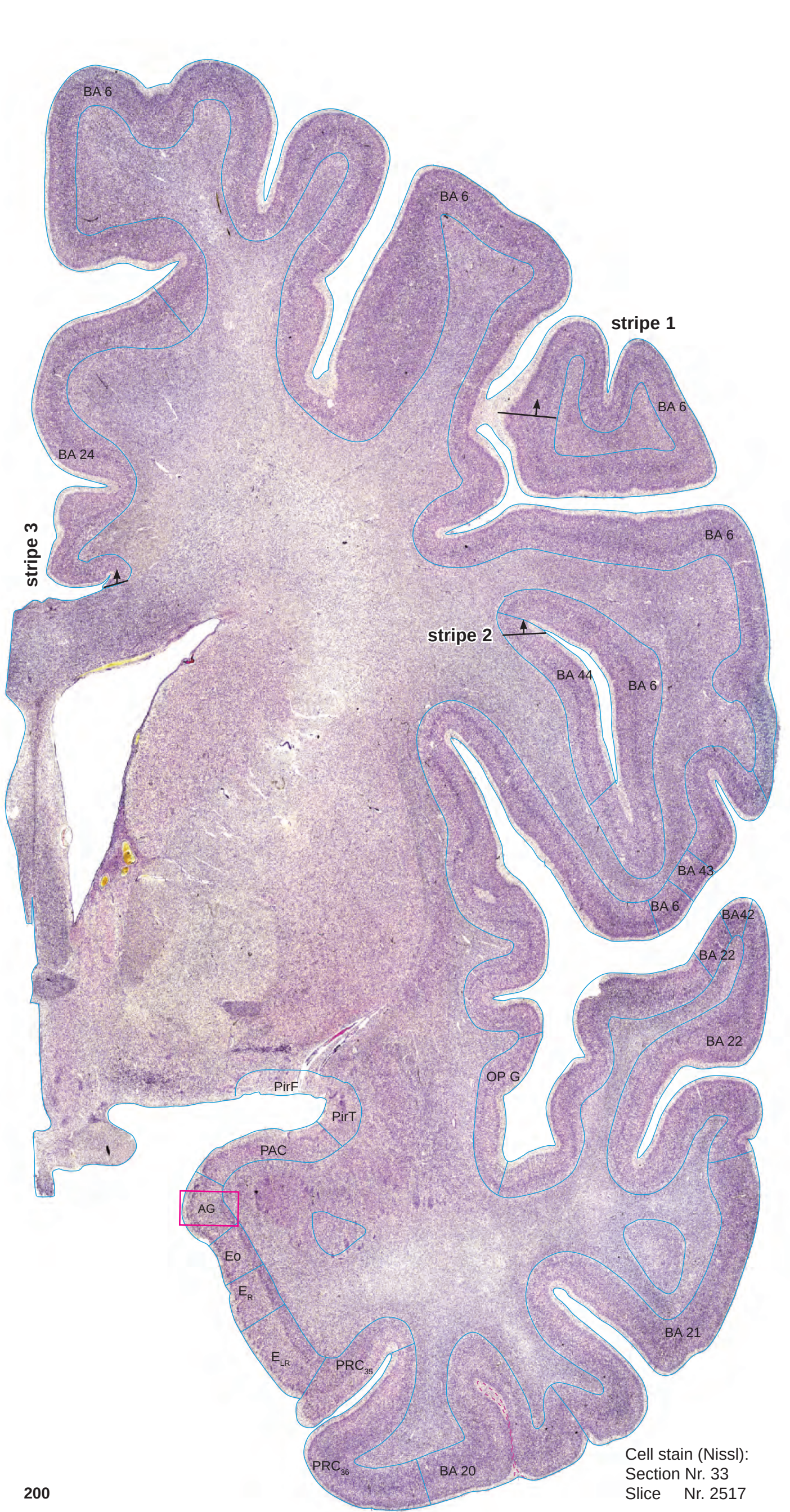
Cortex: Brodmann Areas

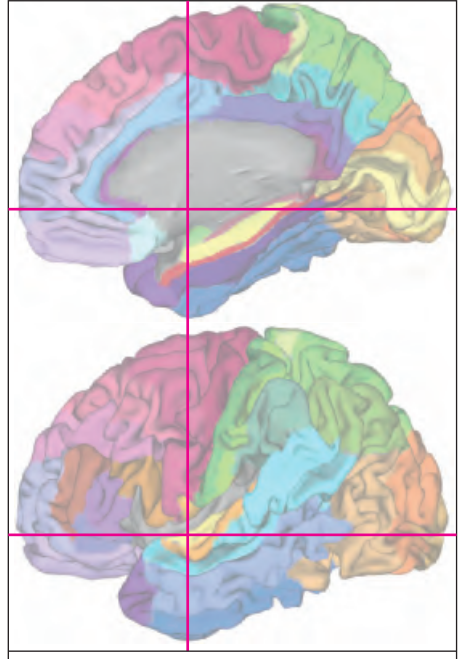
MNI: -0.79
ICL: 0.70
MCP: -14.04



BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
ac anterior commissure
AG ambiens gyrus
BC basal n., compact part
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
BSTC bed n. of the stria terminalis, central div.
BSTL bed n. of the stria terminalis, lateral div.
BSTM bed n. of the stria terminalis, medial div.
BSTV bed n. of the stria terminalis, ventral div.
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
db diagonal band (Bandeletta diagonalis)
DiCl diffuse insular claustrum
DPeH dorsal periventricular hypothalamic n.
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
Eo entorhinal cortex, olfactory subfield
ER entorhinal cortex, rostral subfield
FLV frontal horn of lat. ventricle
fpms frontal paramidline sulcus
FPu fundus region of putamen
fx fornix (column and body)
GTI great terminal island
ic internal capsule
IGr indusium griseum
ilf inferior longitudinal fc
InfS infundibular stalk
iprs inferior precentral sulcus
irhs intrarhinal sulcus
its inferior temporal sulcus
La lateral amygdaloid n.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
lml lateral medullary lamina of the globus pallidus
lo lateral olfactory tract
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
mfb medial forbrain bundle
mml medial medullary lamina of the globus pallidus
MPO medial preoptic n.
MS medial septal n.
OP G gustatory cortex (mapped from Öngür et.al., 2003)
ox optic chiasma
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaMC paraventricular n., magnocellular p.
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
sfs superior frontal sulcus
SO supraoptic n.
sprs superior precentral sulcus
SSTI substriatal terminal island
st stria terminalis
sts superior temporal sulcus
sv septal vein
SxD sexual dimorphic n.
TCl temporal claustrum
TS triangular septal n.
tsv thalamostriate vein
Tu olfactory tubercle
TuTI tubercular terminal islands
unc uncinate fc
Unn uncinate nucleusv
unn uncal notch
VCl ventral claustrum
VGP ventral globus palidus





MNI Position y = -0.76 mm
AHB Position y = 0.73 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAC periamygdaloid cortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Brodmann Areas

BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA24 area cingularis anterior ventralis
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
BA44 area opercularis
Hi hippocampus
OP_G gustatory cortex (by Öngür et al. 2003)
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

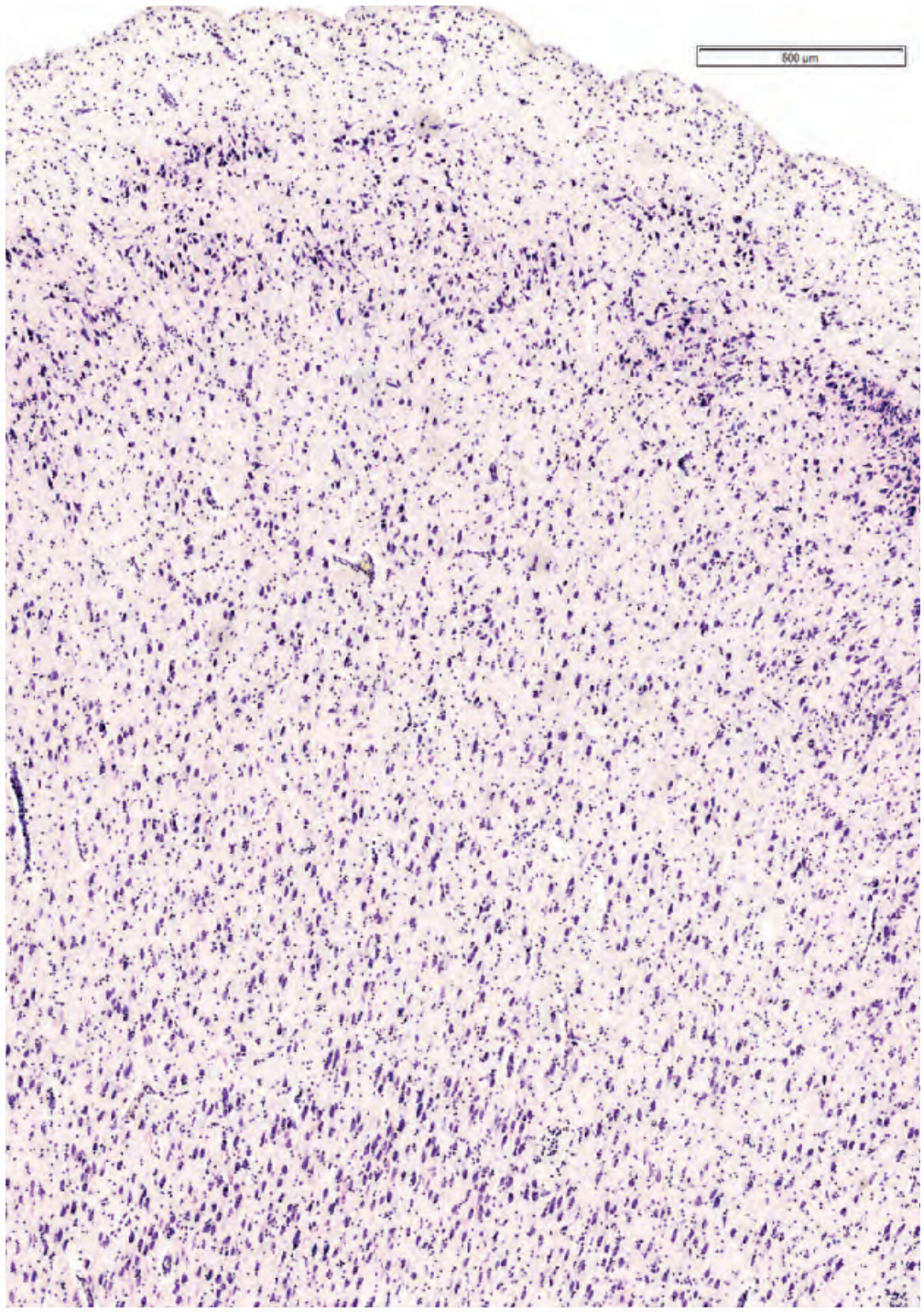
von Economo and Koskinas

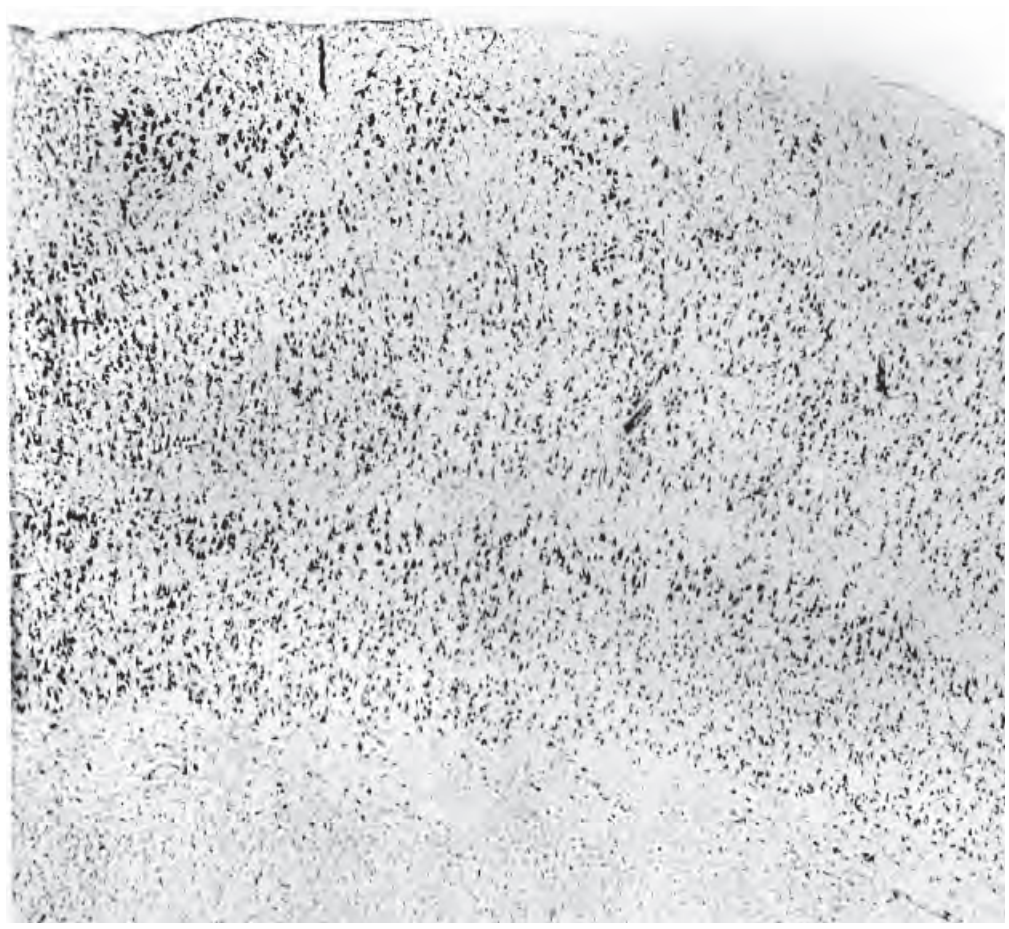
FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24
p24‘ anterior division of BA24

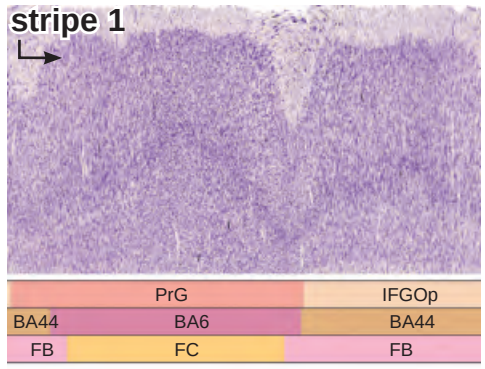
Cell stain (Nissl):
Section Nr. 33
Slice Nr. 2517

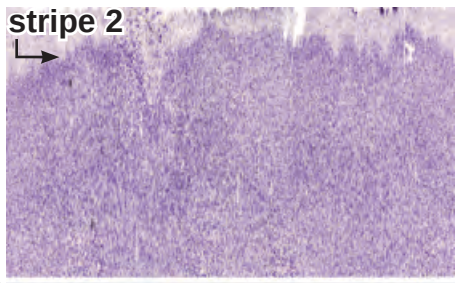


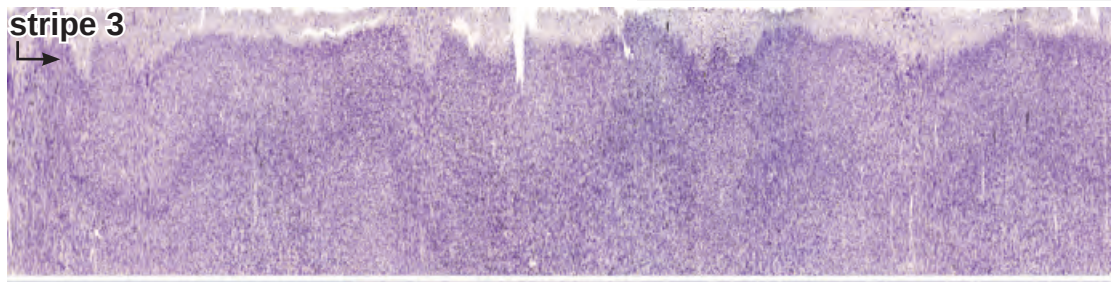


HA(1) Area uncinata.

von Economo and Koskinas (1925) Plate C (100)

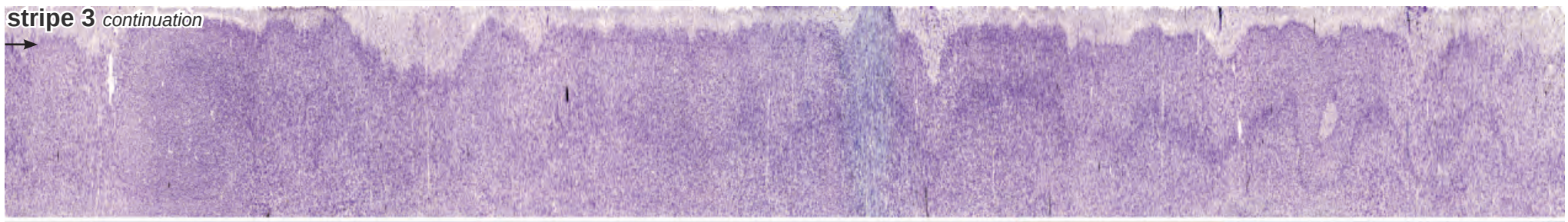




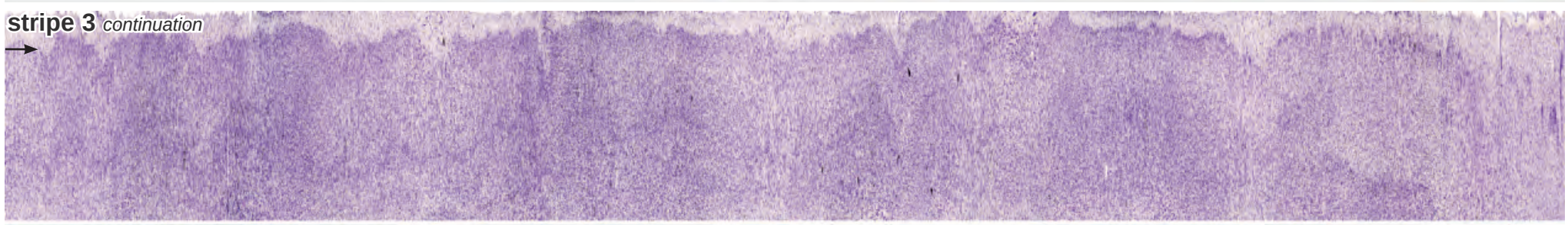


Gyral pattern	MFG	PrG	MFG
Brodmann areas	BA6		
von Economo	FB	FA	FB

CG	SFGM	SFGL	
BA24	BA6		
Ia2	Ia	FB	
a33‘	p24‘	a24‘	p24c‘

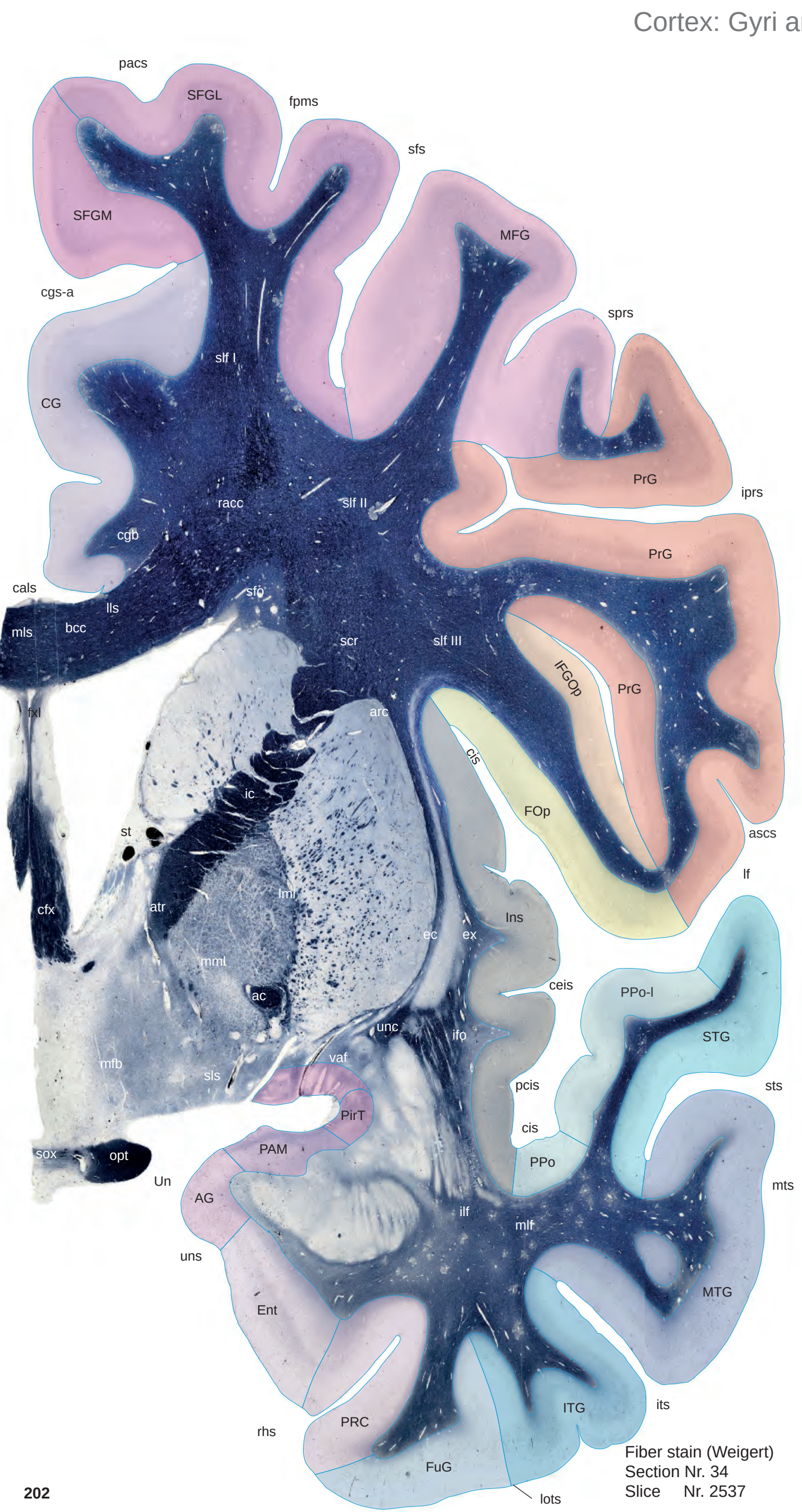


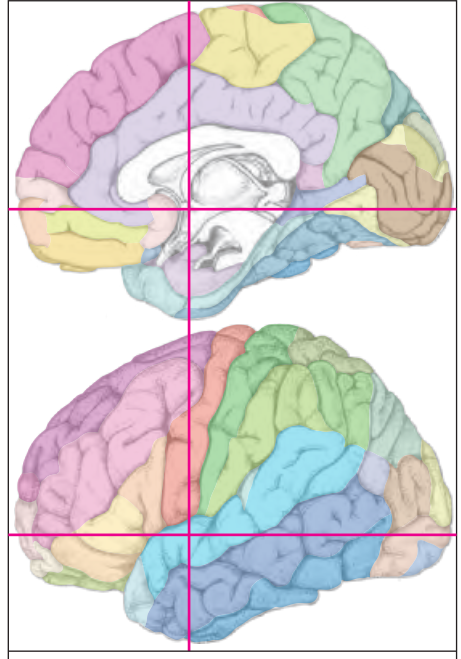
SFGL	MFG	PrG	FOp	Ins	PPo					
BA6	BA43	BA6	OP_G							
FB	FA	FB	FC	IA1	IA2	IAB	IB	IBT		



PPo	PPo-l	STG	MTG	ITG	FuG	PRC	Ent	AG	Pir	
BA22	BA42	BA22	BA21	BA20	PRC36	PRC35	Hi			
IBT	TA	TE1	TE2	TG						

Cortex: Gyri and Sulci





MNI Position y = -1.35 mm
AHB Position y = 1.26 mm

Fiber stain (Weigert)
Section Nr. 34
Slice Nr. 2537

Gyri

AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PAM periamygdaloid cortex
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)
mts middle temporal sulcus

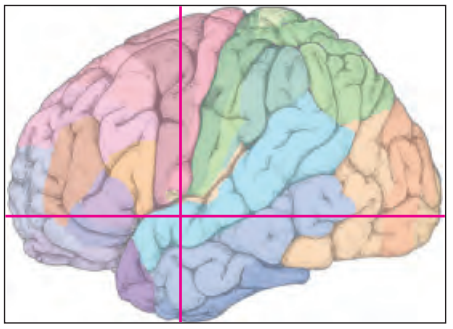
Fibers

ac anterior commissure
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cfx column of fornix
cgb cingulum bundle
ec external capsule
ex extreme capsule
fxl fornix longus
ic internal capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
sox supraoptic commissure
st stria terminalis
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Cortex: Brodmann Areas

34

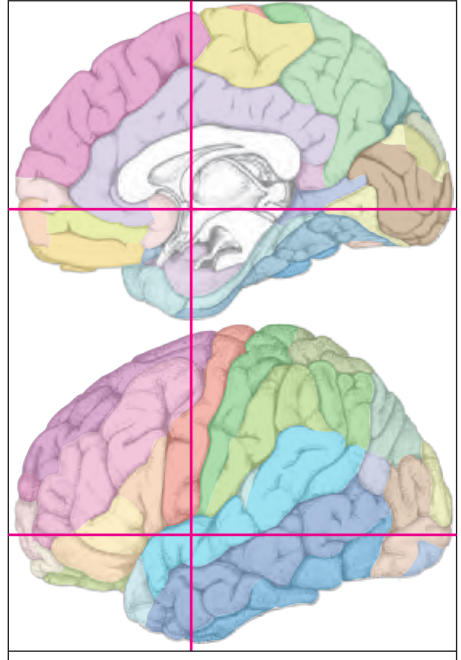
MNI: -1.35
ICL: 1.26
MCP: -13.48



BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
ac anterior commissure
ACo anterior cortical amygdaloid n.
AG ambiens gyrus
AH anterior hypothalamic area
BC basal n., compact part
BD basal n., diffuse part
BL basolateral amygdaloid n.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
BSTC bed n. of the stria terminalis, central div.
BSTLJ bed n. of the stria terminalis, lateral division, juxtacapsular p.
BSTP bed n. of the stria terminalis, posterior div.
BSTV bed n. of the stria terminalis, ventral div.
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
CoCl compact insular claustrum
CSP cavity of septum pellucidum
CxA cortico-amygdaloid transition area
DCl dorsal claustrum
DiCl diffuse insular claustrum
DoH dorsal hypothalamic n.
EA extended amygdala
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
Eo entorhinal cortex, olfactory subfield
ER entorhinal cortex, rostral subfield
fpms frontal paramidline sulcus
FPu fundus region of putamen
fx fornix (column)
GSL gyrus semilunaris
IGr indusium griseum
InfS infundibular stalk
iprs inferior precentral sulcus
its inferior temporal sulcus
La lateral amygdaloid n.
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LSV lateral septal n., ventral p.
LV lateral ventricle
mfb medial forbrain bundle
mml medial medullary lamina of globus pallidus
MPO medial preoptic n.
MS medial septal n.
opt optic tract
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaFo paraventricular n., fornical p.
PAM periamygdaloid cortex
PaMC paraventricular n., magnocellular p.
PaPC paraventricular n., parvicellular p.
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
SCGP supracapsular part of globus pallidus
SCh suprachiasmatic n.
SCS subcallosal stratum
SFO subfornical organ
sfs superior frontal sulcus
SO supraoptic n.
sox supraoptic commissure
sprs superior precentral sulcus
SSTl substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
tsv thalamostriate vein
Tu olfactory tubercle
Un uncus
unc uncinate fc
unn uncal notch
VCl ventral claustrum
VGP ventral globus palidus

Cortex: Gyri and Sulci



MNI Position y = -2.25 mm
AHB Position y = 2.07 mm

Fiber stain
Section Nr. 35
Slice Nr. 2567

Gyri

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PHA parahippocampal-amygdaloid transition area
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

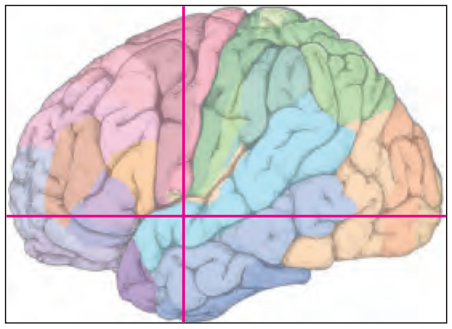
ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-a cingulate sulcus, anterior part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

Fibers

ac anterior commissure
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cfx column of fornix (pars tecta)
cgb cingulum bundle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fx fornix (column)
fxl fornix longus
ic internal capsule
ifo inferior fronto-occipital fascicle
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
st stria terminalis
unc uncinate fascicle
vaf ventral amygdalofugal pathway

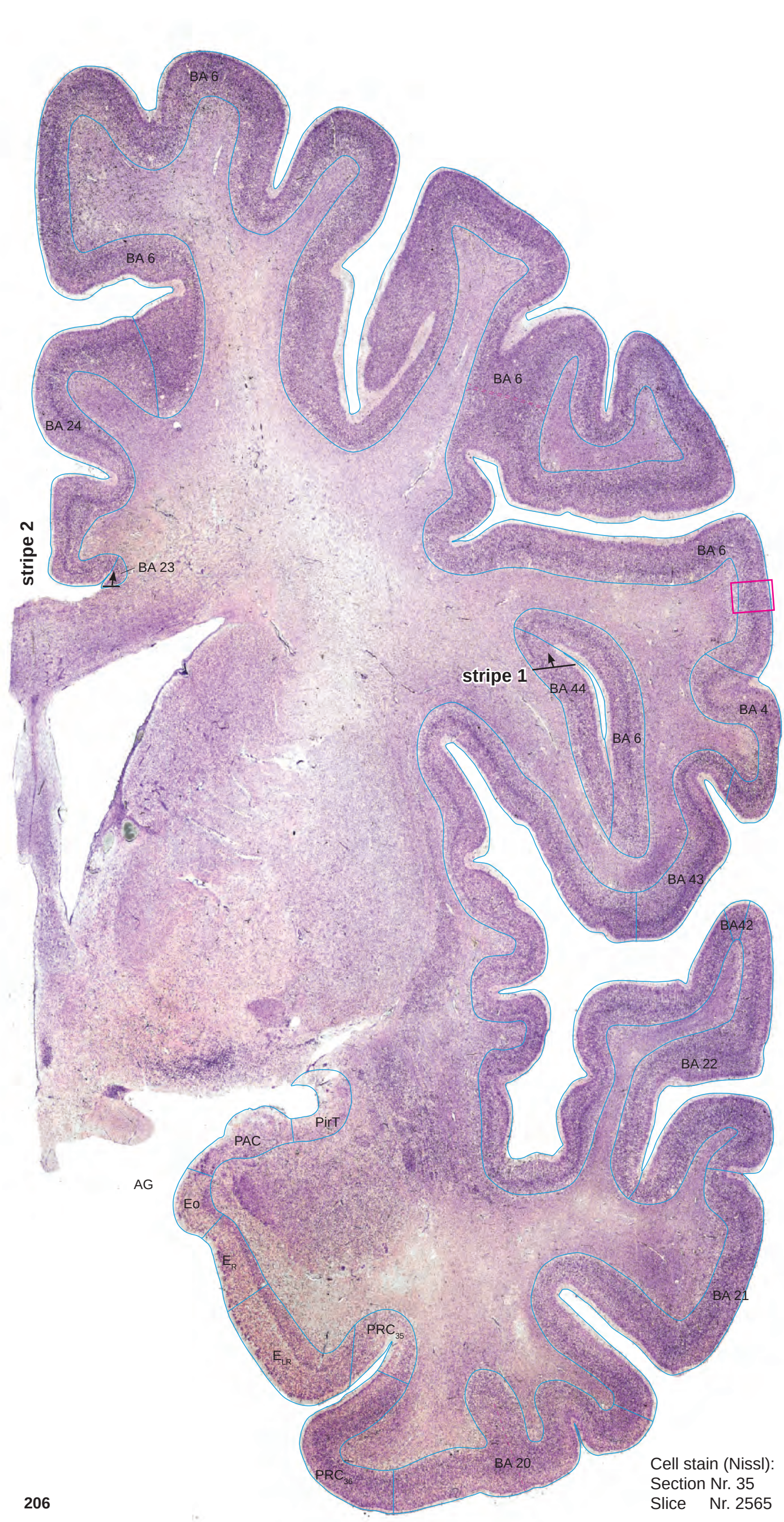
Cortex: Brodmann Areas

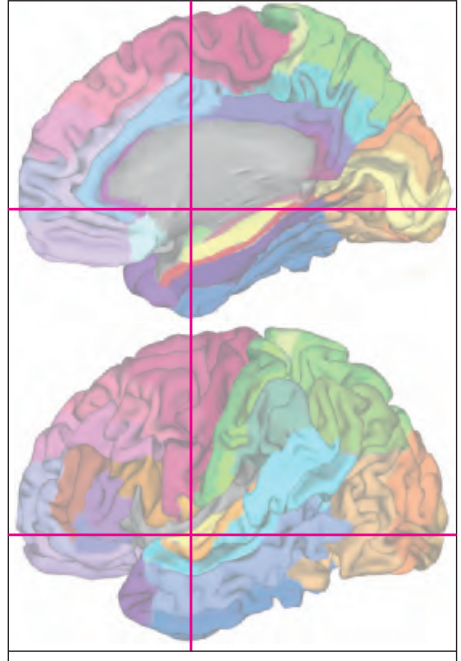
MNI: -2.25
ICL: 2.07
MCP: -12.67



BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
ac anterior commissure
ACo anterior cortical amygdaloid n.
AG ambiens gyrus
AH anterior hypothalamic area
BC basal n., compact p.
BD basal n., diffuse p.
BL basolateral amygdaloid n.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
BSTC bed n. of the stria terminalis, central div.
BSTLJ bed n. of the stria terminalis, lateral division, juxtacapsular p.
BSTP bed n. of the stria terminalis, posterior div.
BSTV bed n. of the stria terminalis, ventral div.
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-a cingulate sulcus, anterior p.
cis circular insular sulcus
CoCl compact insular claustrum
CxA cortico-amygdaloid transition area
DCl dorsal claustrum
DiCl diffuse insular claustrum
DoH dorsal hypothalamic n.
EA extended amygdala
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
Eo entorhinal cortex, olfactory subfield
ER entorhinal cortex, rostral subfield
fpms frontal paramidline sulcus
FPu fundus region of putamen
fx fornix (column)
GSL gyrus semilunaris
ic internal capsule
InfS infundibular stalk
iprs inferior precentral sulcus
its inferior temporal sulcus
La lateral amygdaloid n.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of the glob. pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LV lateral ventricle
mfb medial forbrain bundle
mml medial medullary lamina of the glob.pallidus
MPO medial preoptic n.
MS medial septal n.
opt optic tract
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaFo paraventricular n., fornical p.
PAM periamygdaloid cortex
PaMC paraventricular n., magnocellular p.
PaPC paraventricular n., parvicellular p.
PirF piriform cortex, frontal p.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
sas semiannular sulcus
SCGP supracapsular p. of globus pallidus
SCh suprachiasmatic n.
SFO subfornical organ
sfs superior frontal sulcus
SO supraoptic n.
sox supraoptic commissure
sprs superior precentral sulcus
SSTI substriatal terminal island
st stria terminalis
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
tsv thalamostriate vein
Tu olfactory tubercle
unc uncinate fc
unn uncal notch
VCl ventral claustrum
VGP ventral globus palidus





MNI Position y = -2.11 mm
AHB Position y = 2.01 mm

Gyral Pattern

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PHA parahippocampal-amygdaloid transition area
PirF piriform cortex, temporal part
PirT piriform cortex, temporal part
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Brodmann Areas

BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
BA44 area opercularis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

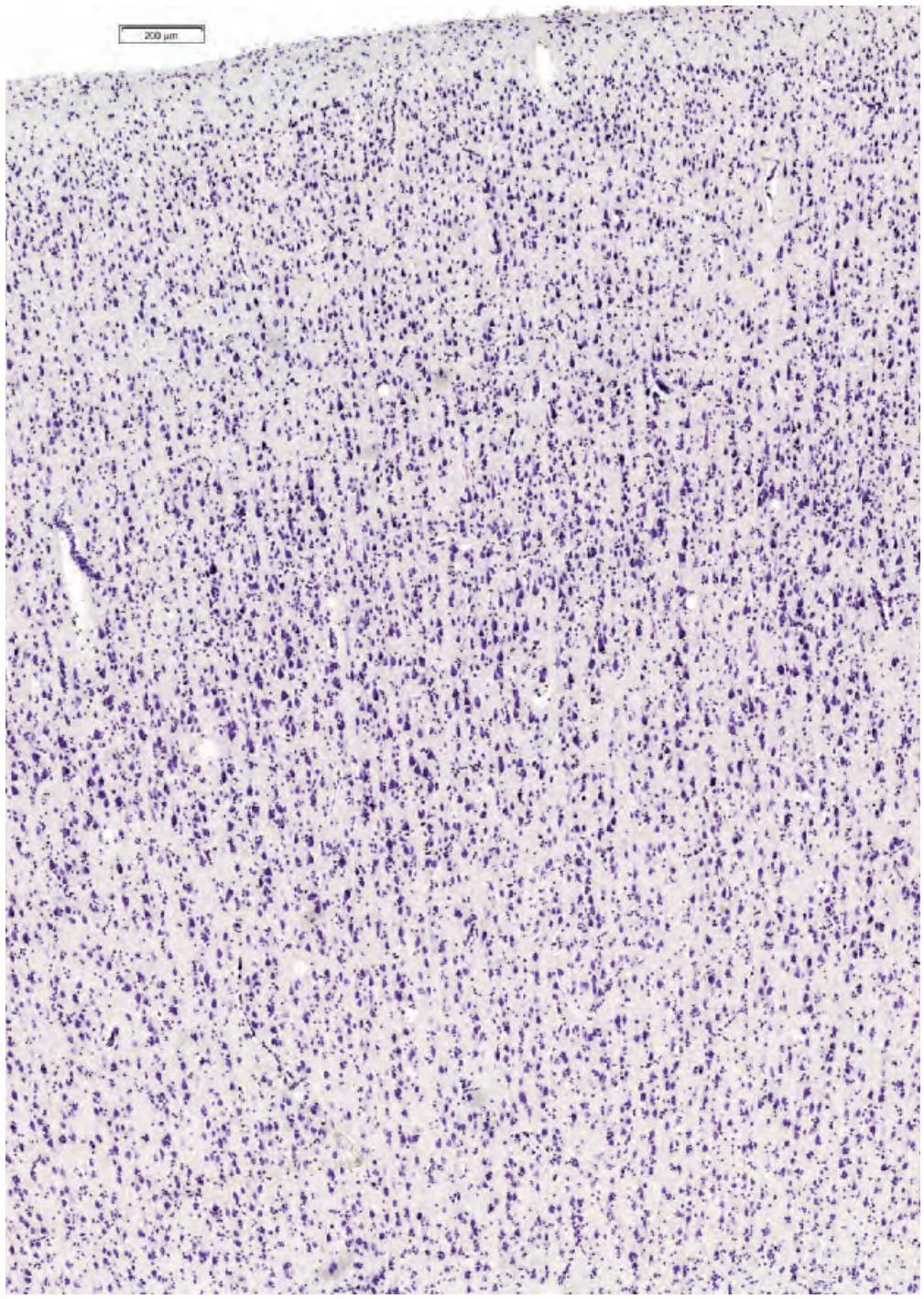
von Economo and Koskinas

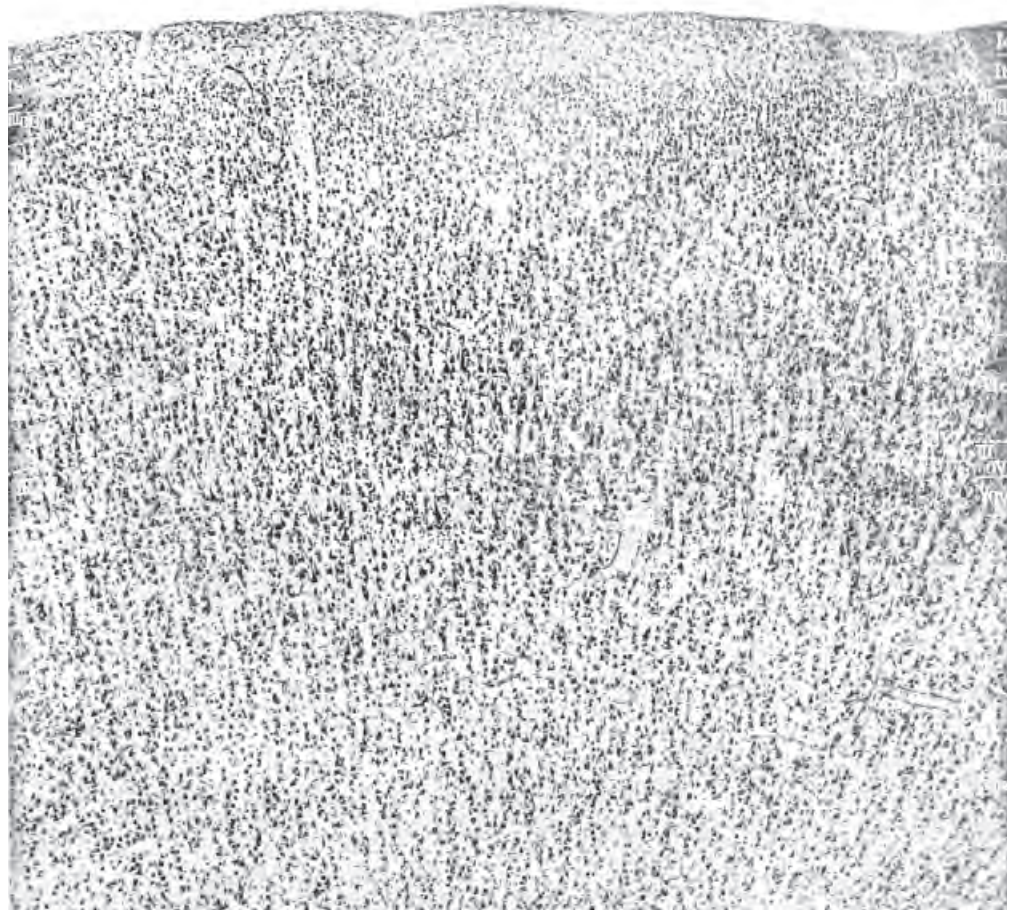
FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

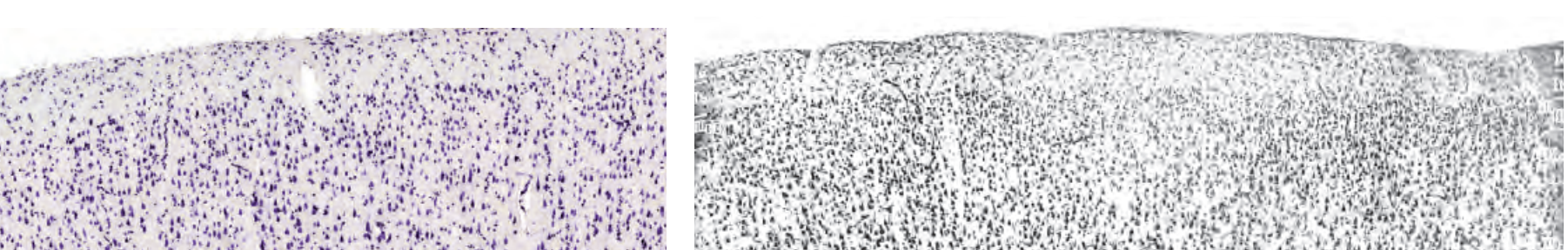
B. Vogt:
a24‘ anterior division of BA24
a33‘ anterior subregion of BA33
p24c‘ anterior division of BA24
p24‘ anterior division of BA24

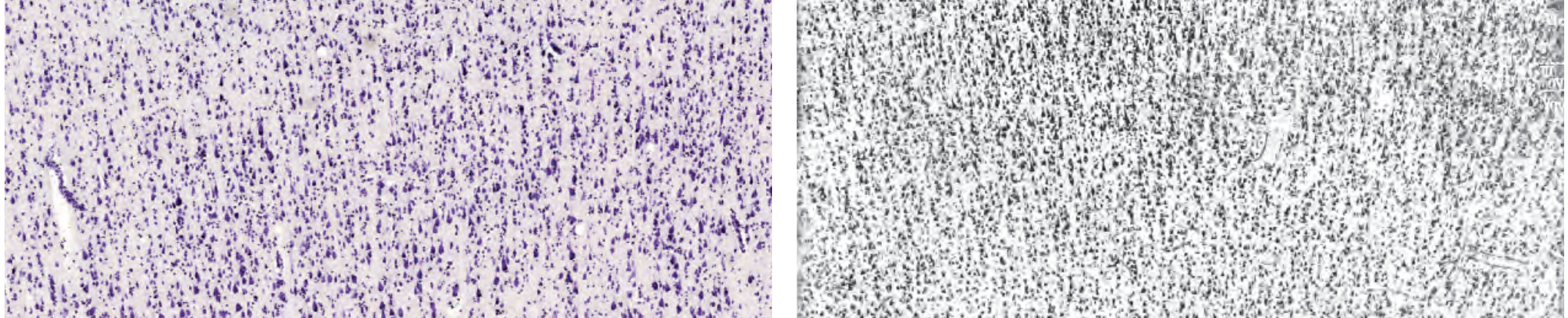
Cell stain (Nissl):
Section Nr. 35
Slice Nr. 2565

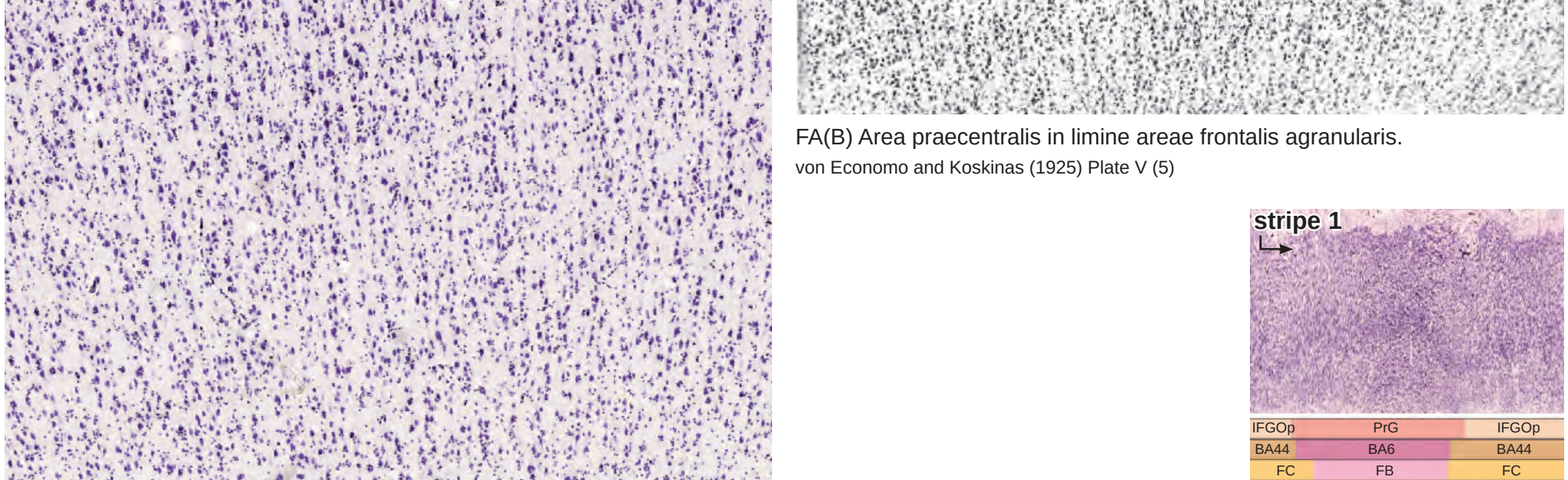




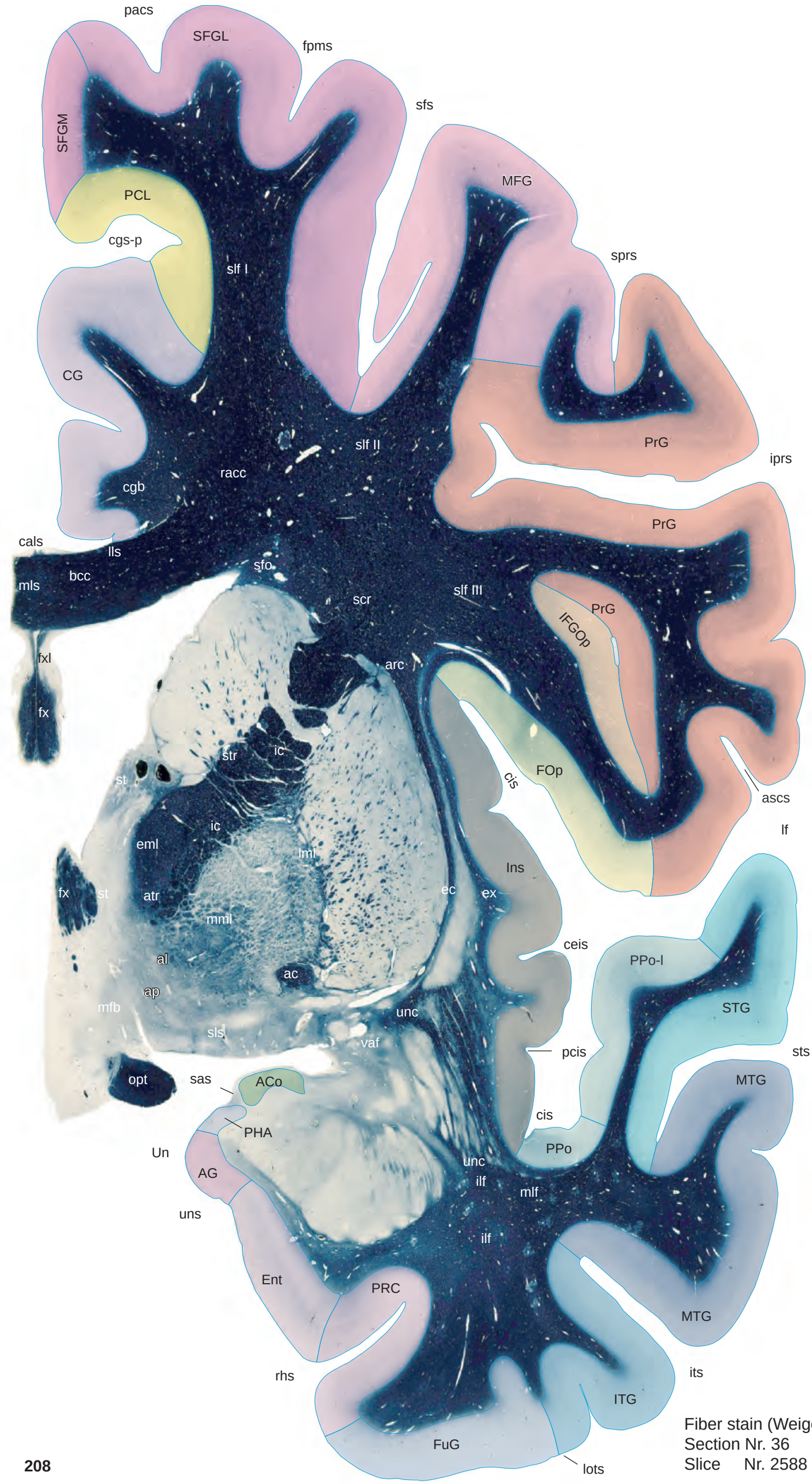
FA(B) Area praecentralis in limine areae frontalis agranularis.
von Economo and Koskinas (1925) Plate V (5)

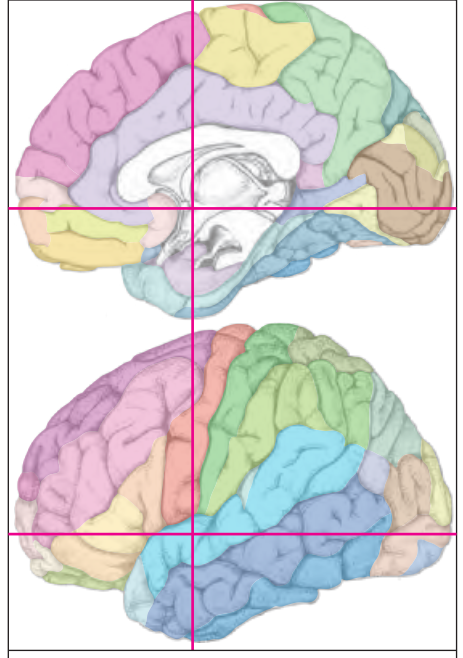






Cortex: Gyri and Sulci





MNI Position y = -2.73 mm
AHB Position y = 2.63 mm

Fiber stain (Weigert)
Section Nr. 36
Slice Nr. 2588

Gyri

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
IFGOp inferior frontal gyrus, opercular part
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHA parahippocampal-amygdaloid transition area
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
fpms frontal paramidline sulcus
iprs inferior precentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

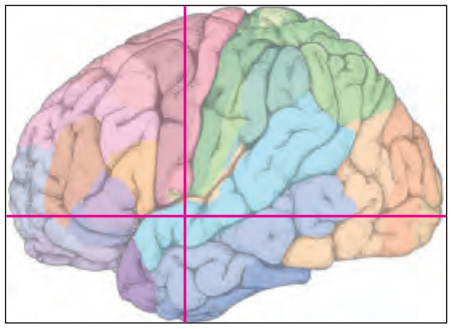
Fibers

ac anterior commissure
al ansa lenticularis
ap ansa peduncularis
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fx fornix (column)
fxl fornix longus
ic internal capsule
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
st stria terminalis
str superior thalamic stria
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Cortex: Brodmann Areas

36

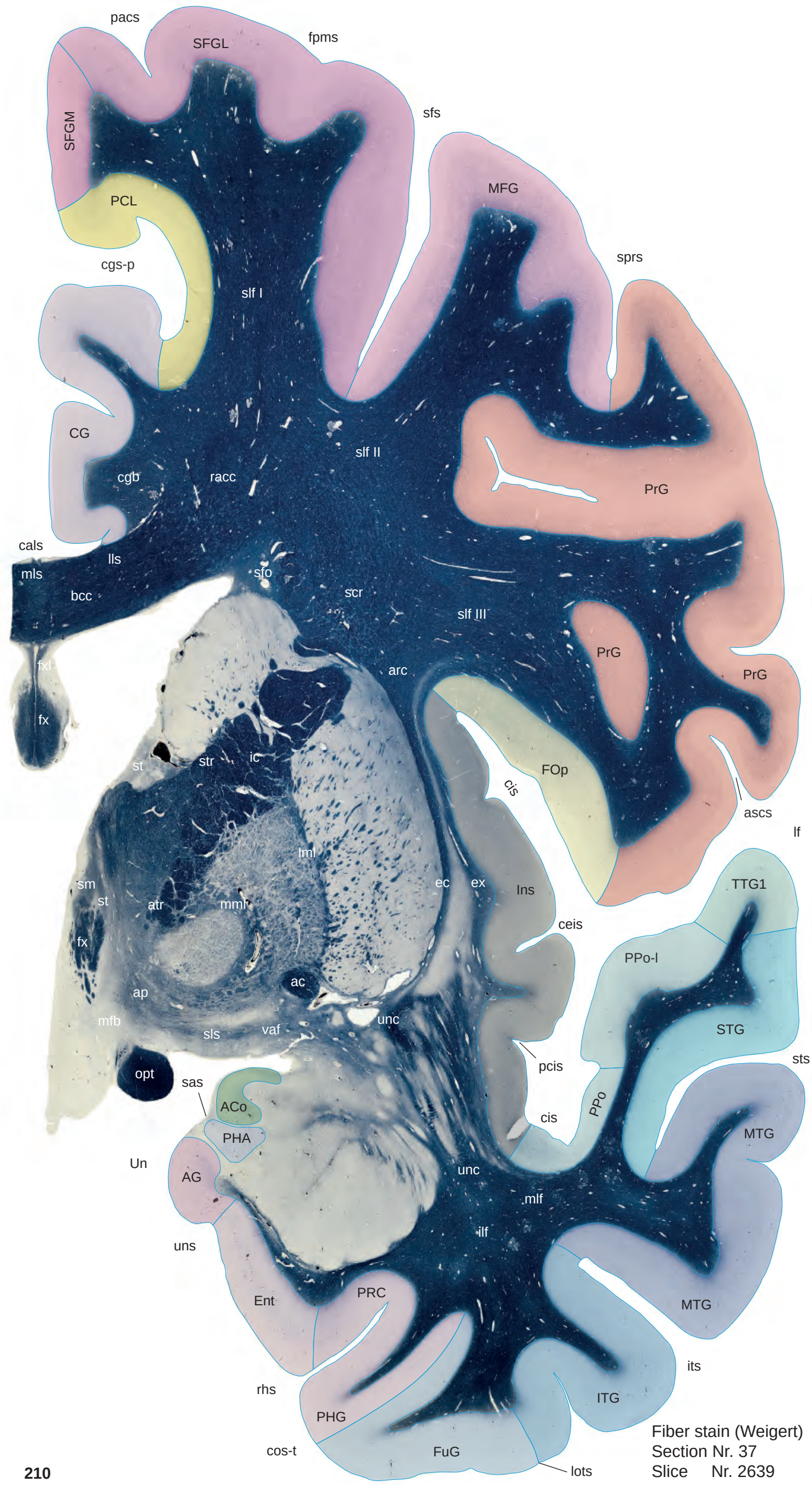
MNI: -2.73
ICL: 2.63
MCP: -12.11



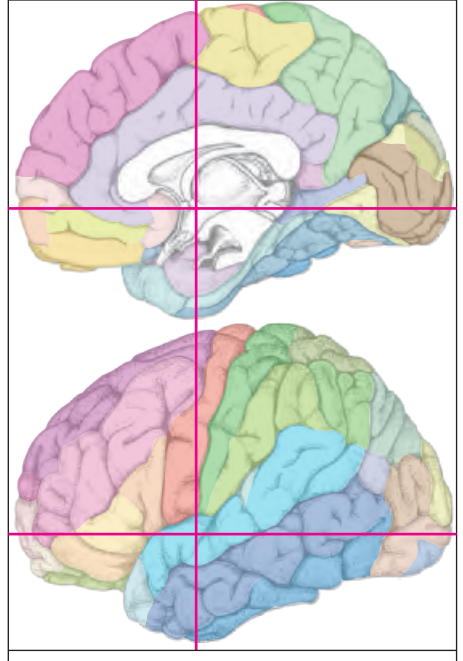
BA1-52 Brodmann areas 1-52 (see p. 101)

AAA anterior amygdaloid area
ac anterior commissure
ACoD anterior cortical amygdaloid n., dorsal p.
ACoV anterior cortical amygdaloid n., ventral p.
AH anterior hypothalamic area
AI amygdaloid island
aic anterior lim of the internal capsule
ap ansa peduncularis
Arc arcuate n.
BC basal n., compact part
BD basal n., diffuse part
BL basolateral amygdaloid n.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
BSTC bed n. of the stria terminalis, central div.
BSTCV ventral extension of BSTC
BSTLJ bed n. of the stria terminalis, lateral div.
BSTP bed n. of the stria terminalis, posterior div.
CdL lateral caudate n.
CdM medial caudate n.
CdV ventral caudate n.
cgs-p cingulate sulcus, posterior p.
cis circular insular sulcus
CoCl compact insular claustrum
CSP cavity of septum pellucidum
DCl dorsal claustrum
DH dorsal hypothalamic area
DiCl diffuse insular claustrum
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
EMI entorhinal cortex, medial im. subfield
ER entorhinal cortex, rostral subfield
FPu fundus region of putamen
fx fornix (colum)
GSL gyrus semilunaris
IGP internal globus pallidus
iprs inferior precentral sulcus
IVF interventricular foramen
La lateral amygdaloid n.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of the glob. pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LV lateral ventricle
mfb medial forbrain bundle
mml medial medullary lamina of the glob.pallidus
MS medial septal n.
opt optic tract
PAC periamygdaloid cortex
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaMC paraventricular n., magnocellular p.
PaPC paraventricular n., parvicellular p.
Pe periventricular n.
PHA parahippocampal-amygdaloid transition a.
PirT piriform cortex, temporal p.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
sas semiannular sulcus
SCGP supracapsular p. of globus pallidus
SFO subfornical organ
sfs superior frontal sulcus
SGl substantia gliosa
SODL supraoptic n., dorsolat. p.
SOVM supraoptic n., ventromed. p.
sox supraoptic commissure
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
tsv thalamostriate vein
unn uncal notch
vaf ventral amygdalofugal pathway
VCl ventral claustrum
VMHDM ventromedial hypothalamic n., dorso medial p.
VMHVL ventromedial hypothalamic n., ventro lateral p.

Cortex: Gyri and Sulci



Fiber stain (Weigert)
Section Nr. 37
Slice Nr. 2639



MNI Position y = -4.17 mm
AHB Position y = 4.00 mm

Gyri

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHA parahippocampal-amygdaloid transition area
PHG parahippocampal gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

ascs anterior subcentral sulcus
cals callosal sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-t collateral sulcus, temporal ramus
fpms frontal paramidline sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

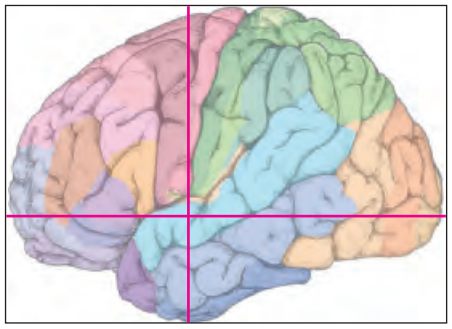
Fibers

ac anterior commissure
ap ansa peduncularis
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
ex extreme capsule
fx fornix (column)
fxl fornix longus
ic internal capsule
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sls sublenticular stria
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Cortex: Brodmann Areas

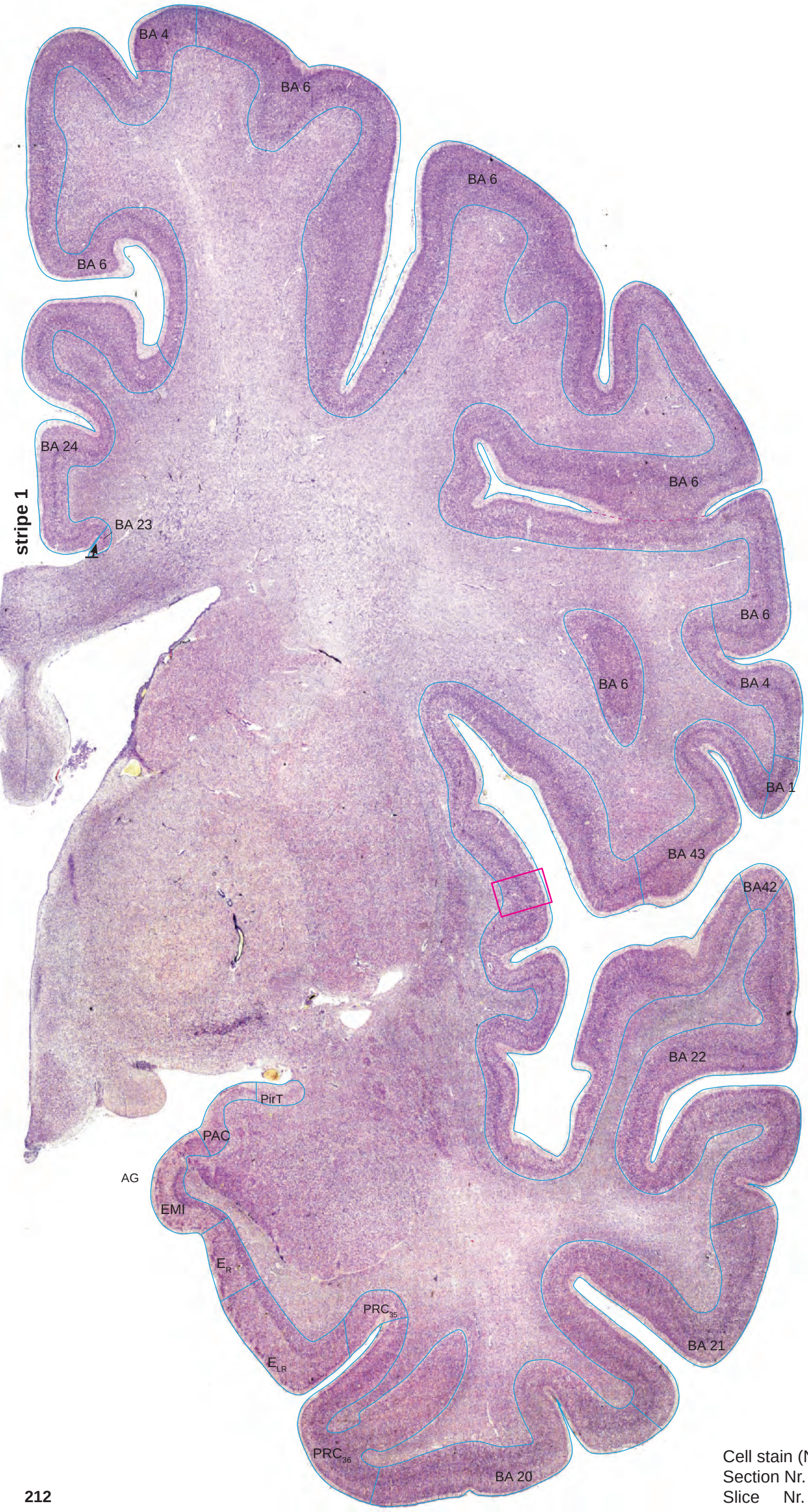
37

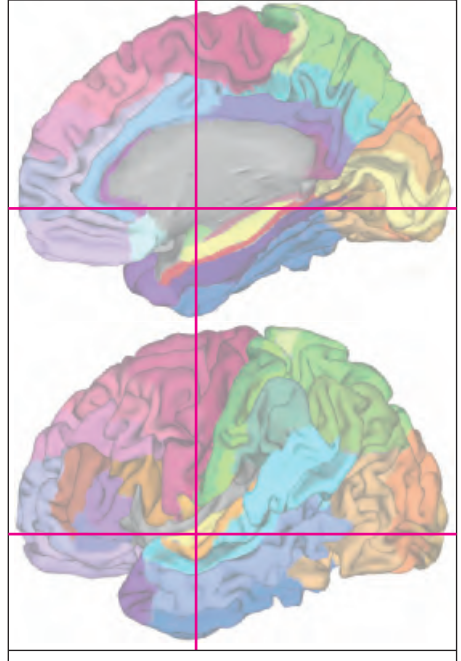
MNI: -4.17
ICL: 4.00
MCP: -10.74



BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
ac anterior commissure
ACoD anterior cortical amygdaloid n., dorsal p.
ACoV anterior cortical amygdaloid n., ventral p.
AG ambiens gyrus
AH anterior hypothalamic area
AI amygdaloid island
al ansa lenticularis
ap ansa peduncularis
Arc arcuate n.
ASt amygdalostriatal transition area
BD basal n., diffuse part
BL basolateral amygdaloid n.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
CdL lateral caudate n.
CdM medial caudate n.
Ce central amygdaloid n.
cgs-p cingulate sulcus, posterior p.
cis circular insular sulcus
CoCl compact insular claustrum
DCl dorsal claustrum
DiCl diffuse insular claustrum
DMH dorsomed. hypothalamic n.
EGP external globus pallidus
ELR entorhinal cortex, lateral rostral subfield
EMI entorhinal cortex, medial im.subfield
ER entorhinal cortex, rostral subfield
FPu fundus region of putamen
fx fornix (column and body)
GSL gyrus semilunaris
IGP internal globus pallidus
IGr indusium griseum
ithp inferior thalamic peduncle
its inferior temporal sulcus
IVF interventricular foramen
La lateral amygdaloid n.
LaDL lateral amygdaloid n., dorsolateral p.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LV lateral ventricle
MeA medial amygdaloid n., ant. p.
mfb medial forbrain bundle
mml medial medullary lamina of globus pallidus
MS medial septal n.
opt optic tract
PACl preamygdalar claustrum
pacs paracentral sulcus
PaD paraventricular n., dorsal p.
PaMC paraventricular n., magnocellular p.
PaPC paraventricular n., parvicellular p.
PaPo paraventricular hypothalamic n., post. p.
Pe periventricular n.
PeF perifornical n.
PHA parahippocampal-amygdaloid transit. area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
Pu putamen
rhs rhinal sulcus
sas semiannular sulcus
SCS subcallosal stratum
SEpS subependymal stratum
SFO subfornical organ
sfs superior frontal sulcus
SGl substantia gliosa
sm stria medullaris of thalamus
SODL supraoptic n., dorsolat. p.
SOVM supraoptic n., ventromed. p.
sox supraoptic commissure
sprs superior precentral sulcus
st stria terminalis
sts superior temporal sulcus
sv septal vein
TCl temporal claustrum
tsv thalamostriate vein
unn uncal notch
vaf ventral amygdalofugal pathway
VCl ventral claustrum
VMHDM ventromedial hypoth. n., dorsomedial p.
VMHVL ventromedial hypoth. n., ventrolateral p.





MNI Position y = -4.16 mm
AHB Position y = 3.97 mm

Gyral Pattern

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PAC periamygdaloid cortex
PHG parahippocampal gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

BA1 area postcentralis intermedia
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

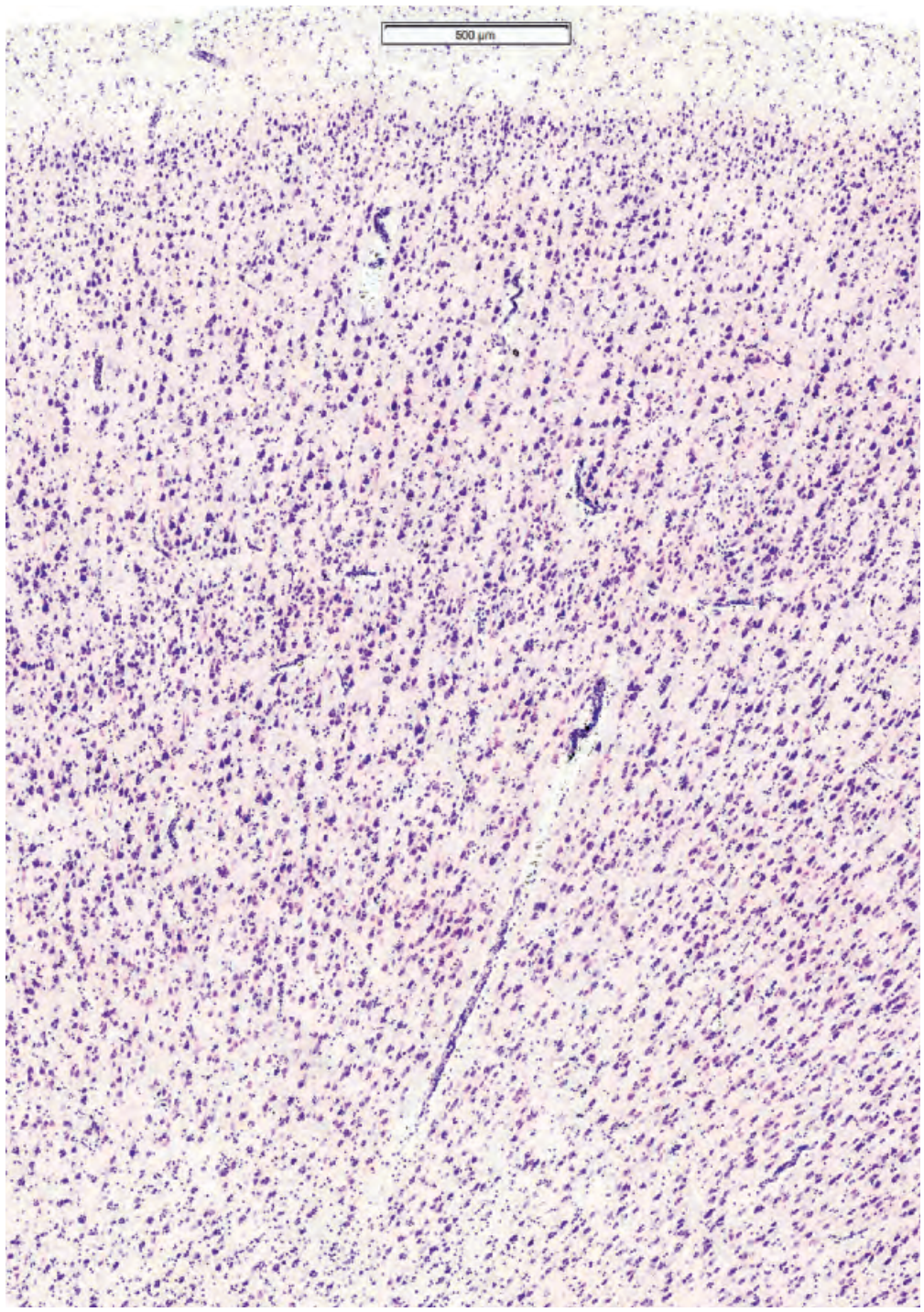
von Economo and Koskinas

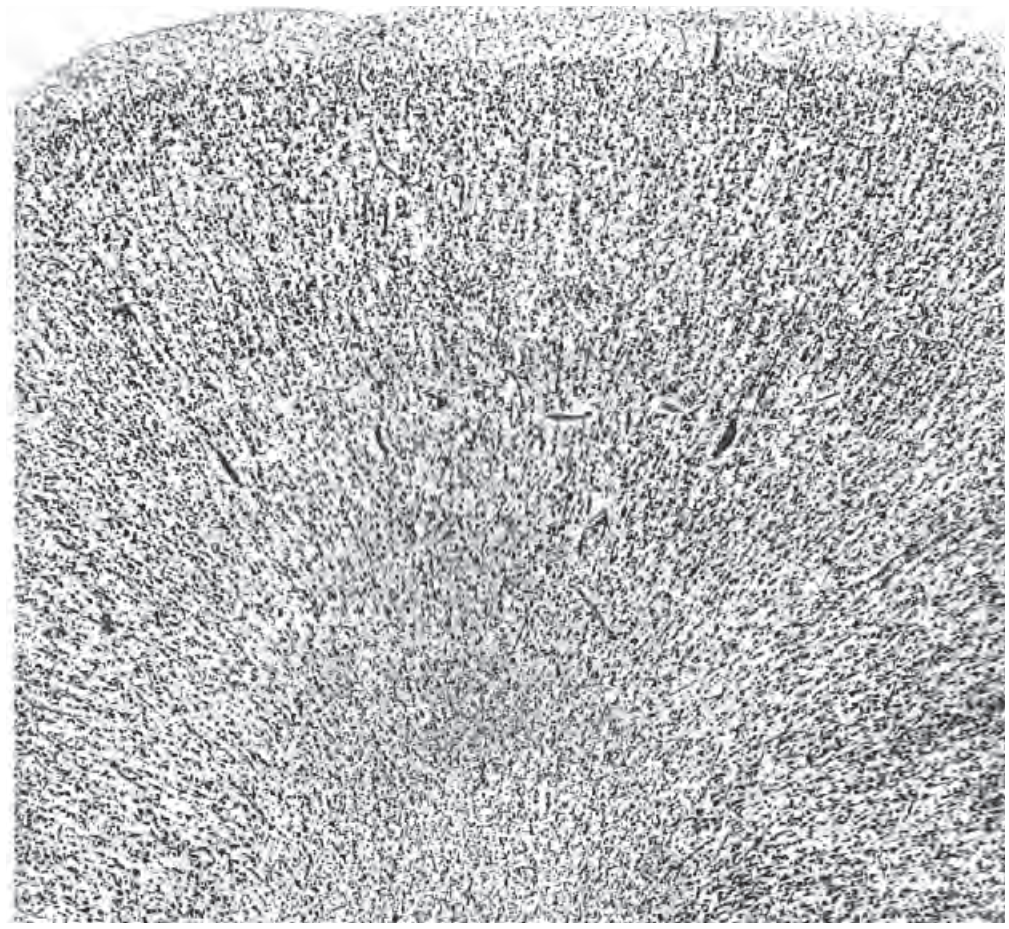
FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LA2 anterior cingulate agranular anterior limbic area
PA pyramidal post- and paracentral area
PC intermediate postcentral area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

B. Vogt:
a24‘ anterior division of BA24
p24c‘ anterior division of BA24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

Cell stain (Nissl):
Section Nr. 37
Slice Nr. 2638

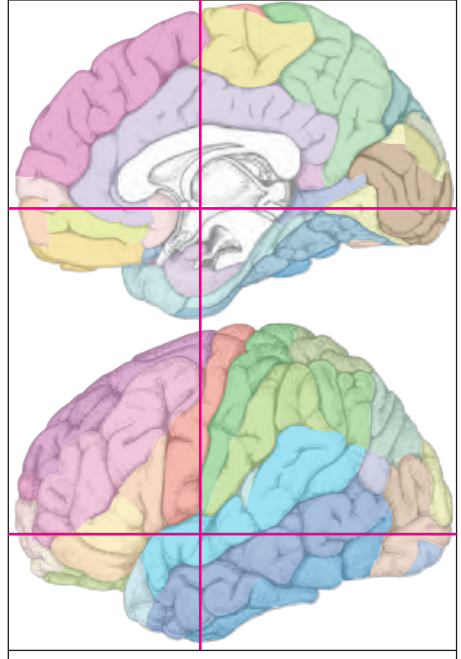




IA2(B) Area praecentralis ventralis insulae (in limine insulae posterior).

von Economo and Koskinas (1925) Plate LV (55)

Cortex: Gyri and Sulci



MNI Position y = -5.66 mm
AHB Position y = 5.58 mm

Gyri

ACo anterior cortical amygdaloid n.
AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHA parahippocampal-amygdaloid transition area
PHG parahippocampal gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

acs acusticus sulcus
ascs anterior subcentral sulcus
cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-t collateral sulcus, temporal ramus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

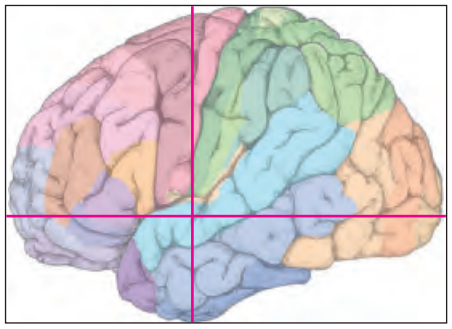
Fibers

ac anterior commissure
al ansa lenticularis
arc arcuate fascicle
atr anterior thalamic radiation
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
ex extreme capsule
fx fornix (column)
fxl fornix longus
ic internal capsule
icml incomplete medullary lamina of the globus pallidus
ilf inferior longitudinal fascicle
ithp inferior thalamic peduncle
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of the globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Fiber stain (Weigert)
Section Nr. 38
Slice Nr. 2698

Cortex: Brodmann Areas

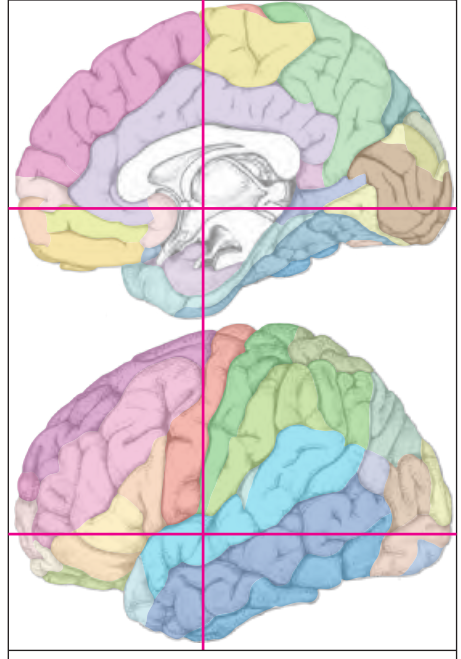
MNI: -5.66
ICL: 5.58
MCP: -9.16



BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
ACoD anterior cortical amygdaloid n., dorsal p.
ACoV anterior cortical amygdaloid n., ventral p.
acs sulcus acusticus
AG ambiens gyrus
al ansa lenticularis
Arc arcuate n.
ASt amygdalostriatal transition area
BC basal n., compact part
BLD basolateral amygdaloid n., dorsal p.
BLI basolateral amygdaloid n., intermediate p.
BLPL basolateral amygdaloid n., paralaminar p.
BLVL basolateral amygdaloid n., ventrolateral p.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
CdL lateral caudate n.
CdM medial caudate n.
ce central sulcus
Ce central amygdaloid n.
cgs-p cingulate sulcus, posterior p.
CoCl compact insular claustrum
DCl dorsal claustrum
DH dorsal hypothalamic area
DiCl diffuse insular claustrum
DMH dorsomed. hypothalamic n.
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELR entorhinal cortex, lateral rostral subfield
EMI entorhinal cortex, medial interm. subfield
Fa fasciculosus n.
fx fornix (column)
GSL gyrus semilunaris
icml incomplete medullary lamina of gl.pallidus
IGP internal globus pallidus
IGr indusium griseum
IPAC interstitial n. of the posterior limb of the ant. commissure
ithp inferior thalamic peduncle
its inferior temporal sulcus
LaDA lateral amygdaloid n., dorsal anterior p.
LaDL lateral amygdaloid n., dorsolateral p.
LaDM lateral amygdaloid n., dorsomedial p.
LaI lateral amygdaloid n., intermediate p.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
MeA medial amygdaloid n., ant. p.
mml medial medullary lamina of globus pallidus
MS medial septal n.
PACl preamygdalar claustrum
pacs paracentral sulcus
PaO paraoptic n.
PaPo paraventricular hypothalamic n., post. p.
Pe periventricular n.
PeF perifornical n.
PHA parahippocampal-amygdaloid trans. area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
PT paratenial thalamic n.
Pu putamen
PV paraventricular thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
sas semiannular sulcus
SEpS subependymal stratum
sfs superior frontal sulcus
sm stria medullaris of thalamus
SODL supraoptic n., dorsolat. p.
SOVM supraoptic n., ventromed. p.
sox supraoptic commissure
sprs superior precentral sulcus
st stria terminalis
sts superior temporal sulcus
TM tuberomammillary n.
tsv thalamostriate vein
unn uncal notch
VCl ventral claustrum
VMHDM ventromedial hypoth. n., dorsomedial p.
VMHVL ventromedial hypoth. n., ventrolateral p.
ZI zona incerta

Cortex: Gyri and Sulci



MNI Position y = -7.04 mm
AHB Position y = 6.68 mm

Fiber stain (Weigert)
Section Nr. 39
Slice Nr. 2739

Gyri

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHA parahippocampal-amygdaloid transition area
PHG parahippocampal gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

acs acusticus sulcus
ascs anterior subcentral sulcus
cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-t collateral sulcus, temporal ramus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
uns uncal sulcus (impression)

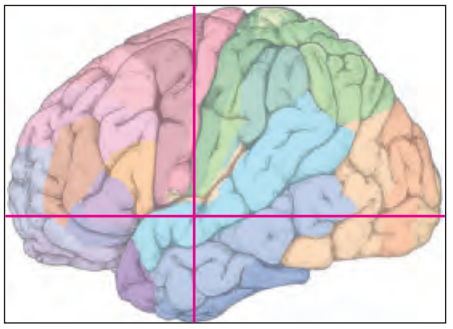
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
ap ansa peduncularis
arc arcuate fascicle
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fx fornix (column and body)
fxl fornix longus
ic internal capsule
icml incomplete medullary lamina of glob. pallidus
ilf inferior longitudinal fascicle
ithp inferior thalamic peduncle
liml limiting medullary lamina of globus pallidus
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
tp tapetum
unc uncinate fascicle
vaf ventral amygdalofugal pathway

Cortex: Brodmann Areas

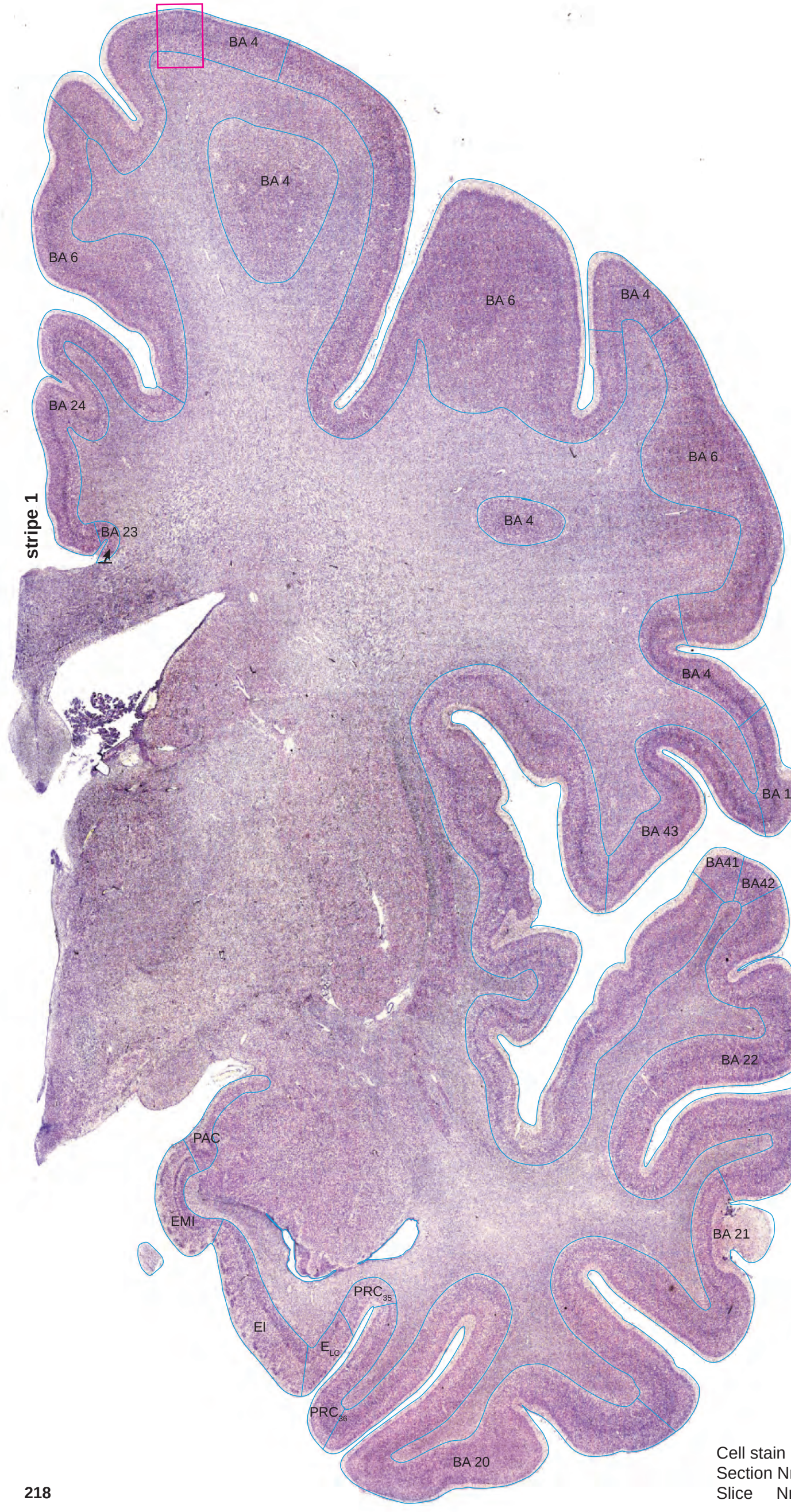
39

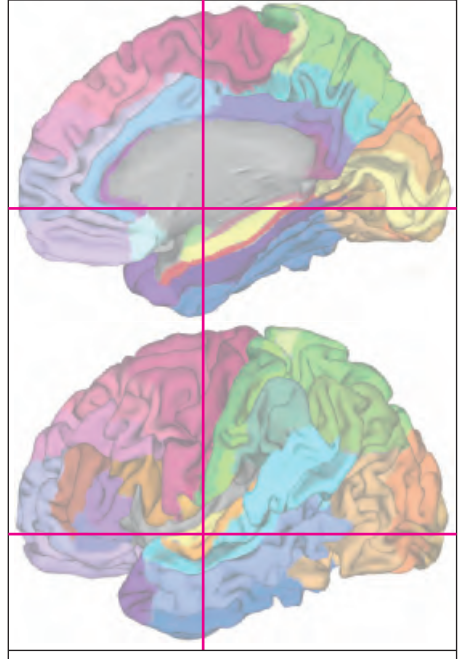
MNI: -7.04
ICL: 6.68
MCP: -8.06



BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
ac anterior commissure
AD anterodorsal thalamic n.
AG ambiens gyrus
al ansa lenticularis
ap ansa peduncularis
Arc arcuate n.
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
BL basolateral amygdaloid n.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
CdM medial caudate n.
ce central sulcus
Ce central amygdaloid n.
cgs-p cingulate sulcus, posterior p.
CoCl compact insular claustrum
cos-t collateral sulcus, temporal ramus
DCl dorsal claustrum
DiCl diffuse insular claustrum
DMH dorsomed. hypothalamic n.
DMHC dorsomedial hypothalamic n., compact p.
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
EMI entorhinal cortex, medial intermed. subfield
eml external medullary lamina of the thalamus
Fa fasciculosus n.
fx fornix (column)
HiH hippocampal head
icml incomplete medullary lamina of gl. pallidus
IGP internal globus pallidus
IGr indusium griseum
irs intrarhinal sulcus
ithp inferior thalamic peduncle
its inferior temporal sulcus
LaDA lateral amygdaloid n., dorsal anterior p.
LaDL lateral amygdaloid n., dorsolateral p.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
liml limiting medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LTu lateral tuberal n.
ME median eminence
MeA medial amygdaloid n., ant. p.
mfb medial forbrain bundle
MS medial septal n.
opt optic tract
pacs paracentral sulcus
PaPo paraventricular hypothalamic n., post. p.
PCo post. cortical amygdaloid n.
Pe periventricular n.
PeF perifornical n.
PHA parahippocampal-amygdaloid transition a.
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
sas semiannular sulcus
SCGP supracapsular p. of globus pallidus
SFO subfornical organ
sfs superior frontal sulcus
sm stria medullaris of thalamus
sprs superior precentral sulcus
SSTI substriatal terminal island
sts superior temporal sulcus
tfx tenia of fornix
TLV temporal horn of lateral ventricle
TM tuberomammillary n.
tsc tenia semicircularis
tsv thalamostriate vein
tt tenia of thalamus
VA ventroanterior n. (ventral anterior n.)
VCl ventral claustrum
VMHDM ventromedial hypoth. n., dorsomedial p.
VMHVL ventromedial hypoth. n., ventrolateral p.
ZI zona incerta





MNI Position y = -7.03 mm
AHB Position y = 6.70 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PAC periamygdaloid cortex
PHG parahippocampal gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

BA1 area postcentralis intermedia
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

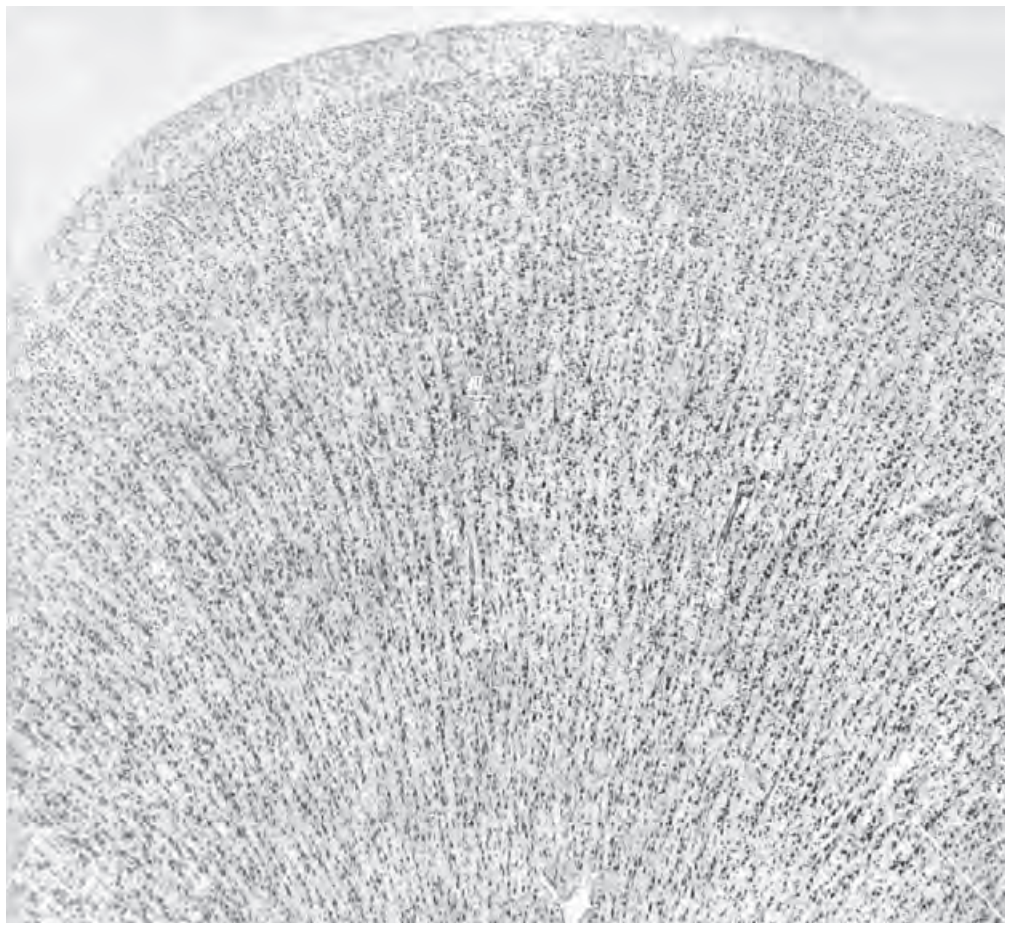
von Economo and Koskinas

FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA1 dorsal precentral insular area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
La precingulate agranular anterior limbic area
La2 anterior cingulate agranular anterior limbic area
PA pyramidal post- and paracentral area
PC intermediate postcentral area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

Regions of Interest

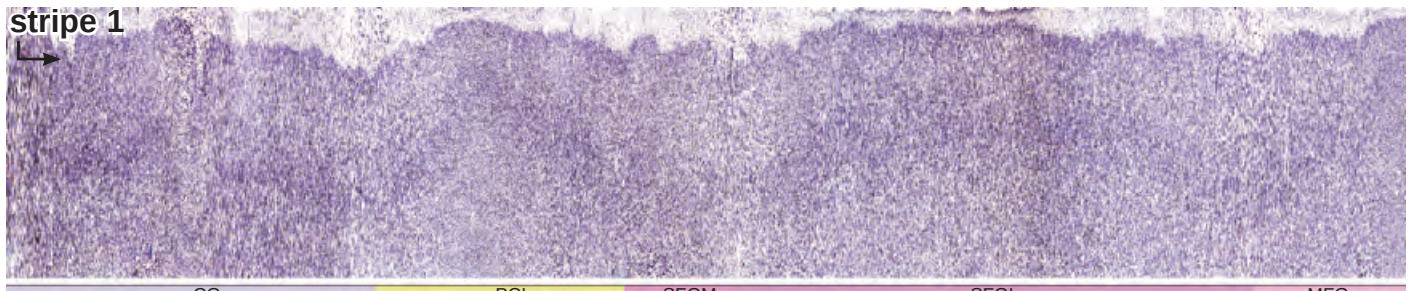
B. Vogt:
p24c‘ anterior division of BA24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

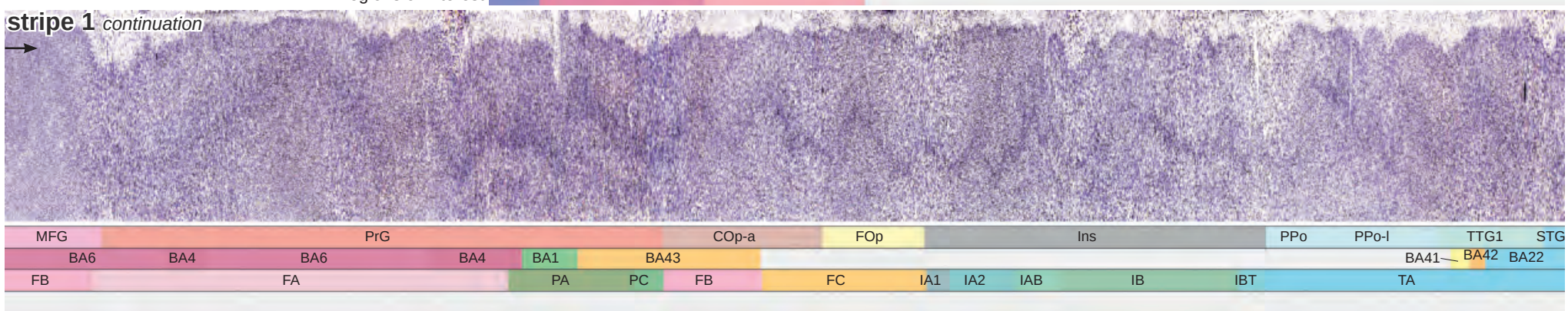
Cell stain (Nissl):
Section Nr. 39
Slice Nr. 2740

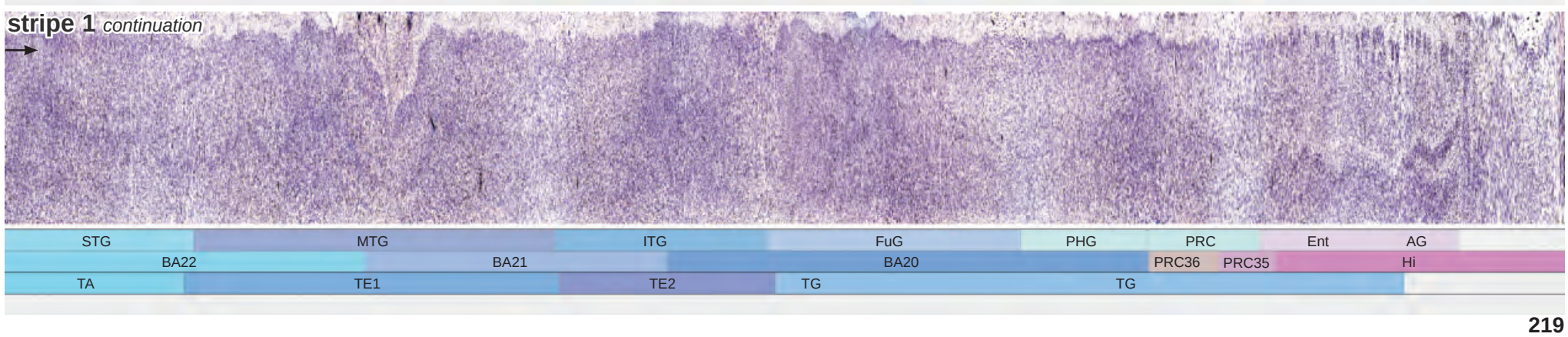


FB Area frontalis agranularis.

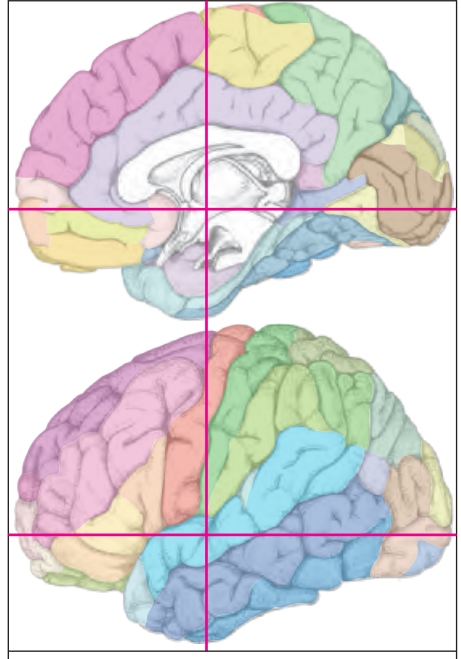
von Economo and Koskinas (1925) Plate VI (6)







Cortex: Gyri and Sulci



MNI Position y = -8.36 mm
AHB Position y = 7.99 mm

Fiber stain (Weigert)
Section Nr. 40
Slice Nr. 2788

Gyri

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

acus sulcus acusticus
ascs anterior subcentral sulcus
cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
du diverticulum unci
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sfs superior frontal sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
unn uncal notch

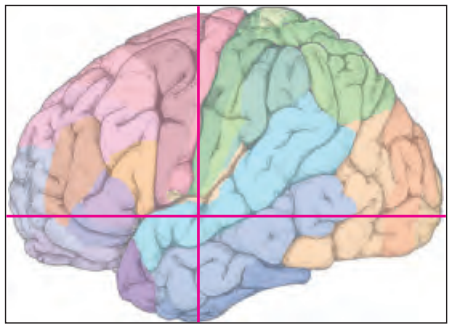
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
cgb cingulum bundle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fx fornix (column and body)
h2 lenticular fascicle
ic internal capsule
icml incomplete medullary lamina of the globus pallidus
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
liml limiting medullary lamina of globus pallidus
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
opt optic tract
palhy pallidohypothalamic fibers
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
sox supraoptic commissure
st stria terminalis
str superior thalamic stria
tp tapetum
unc uncinate fascicle

Cortex: Brodmann Areas

40

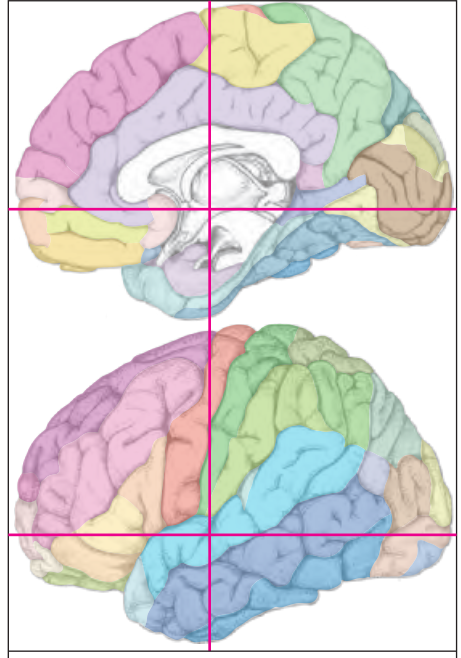
MNI: -8.36
ICL: 7.99
MCP: -6.75



BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
acus sulcus acusticus
AD anterodorsal thalamic n.
AG ambiens gyrus
AI amygdaloid island
al ansa lenticularis
alv alveus of the hippocampus
AM anteromedial thalamic n.
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
BLD basolateral amygd. n., dorsal (magnoc.) p.
BLI basolateral amygdaloid n., intermediate p.
BLPL basolateral amygdaloid n., paralaminar p.
BLVM basolateral amygdaloid n., ventromedi. p.
BMDM basomedial amygdaloid n., dorsomed. p.
BMVM basomedial amygdaloid n., ventromed. p.
Cd caudate n.
ce central sulcus
CeL central amygdaloid n, lat. p.
CeM central amygdaloid n, med. p.
CoCl compact insular claustrum
cos-ph collateral sulcus, parahippocampal r.
DCl dorsal claustrum
DiCl diffuse insular claustrum
DMH dorsomed. hypothalamic n.
du diverticulum unci
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
EMI entorhinal cortex, medial intermed. subfield
eml external medullary lamina of the thalamus
Fa fasciculosus n.
fx fornix (column)
GSL gyrus semilunaris
h2 lenticular fascicle
icml incomplete medullary lamina of gl. pallidus
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
LaDA lateral amygdaloid n., dorsal anterior p.
LaI lateral amygdaloid n., intermediate p.
LaV lateral amygdaloid n., ventral p.
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
liml limiting medullary lamina of globus pallidus
LM lateral mammillary n.
LSD lateral septal n., dorsal p.
LSI lateral septal n., intermediate p.
LTu lateral tuberal n.
mfb medial forbrain bundle
MM medial mammillary n., med. p.
pacs paracentral sulcus
PalHy pallidohypothalamic n.
palhy pallidohypothalamic fibers
PaPo paraventricular hypoth. n., posterior p.
PCo post. cortical amygdaloid n.
PeF perifornical n.
PH posterior hypothalamic area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PRt prereticular zone
PT paratenial thalamic n.
Pu putamen
PV paraventricular thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
S subiculum
sas semiannular sulcus
sfs superior frontal sulcus
sm stria medullaris of thalamus
sox supraoptic commissure
sprs superior precentral sulcus
st stria terminalis
sts superior temporal sulcus
SuM supramammillary n.
TLV temporal horn of lateral ventricle
TM tuberomammillary n.
unc uncinate fc
VA ventroanterior n. (ventral anterior n.)
VCl ventral claustrum
VGP ventral globus pallidus
VMHDM ventromedial hypoth. n., dorsomedial p.
VMHVL ventromedial hypoth. n., ventrolateral p.
ZI zona incerta

Cortex: Gyri and Sulci



MNI Position y = -9.66 mm
AHB Position y = 9.22 mm

PCL
SFGL
pacs
SFGM
maprs
sprs
PrG
PCL
cgs-p
slf I
sprs
CG
MFG
slf II
racc
cgb
PrG
ce
cals
lls
sfo
mls
bcc
scr
slf III
FOp
PrG
arc
fx
cis
PoG
ic
st
str
glc
PrG
sm
iml
eml
ascs
COp-a
lml
ceis
lf
TTG1
ec
ex
Ins
acus
ithp
lenf
mml
h2
liml
icml
al
mfb
comb
ac
pcis
PPo-l
PCI
STG
sts
opt
cis
mp
PPo
sas
unc
st
slic
Un
mlf
tp
3n
alv
ilf
HiH
MTG
unn
cgh
Ent
PRC
PHG
its
rhs
ITG
FuG
cos-ph
lots

Fiber stain (Weigert)
Section Nr. 41
Slice Nr. 2834

Gyri

CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

acus sulcus acusticus
ascs anterior subcentral sulcus
cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
unn uncal notch

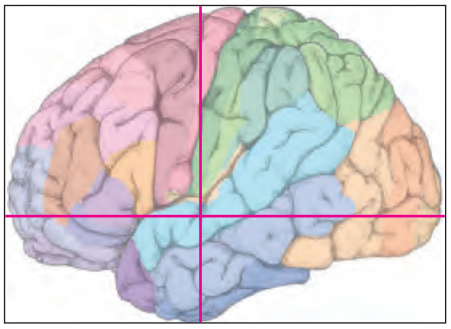
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fx fornix (column and body)
gic genu of internal capsule
h2 lenticular fascicle
ic internal capsule
icml incomplete medullary lamina of glob. pallidus
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
liml limiting medullary lamina of globus pallidus
lls lateral longitudinal stria
lml lateral medullary lamina of the globus pallidus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
mp mammillary peduncle
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
tp tapetum
unc uncinate fascicle

Cortex: Brodmann Areas

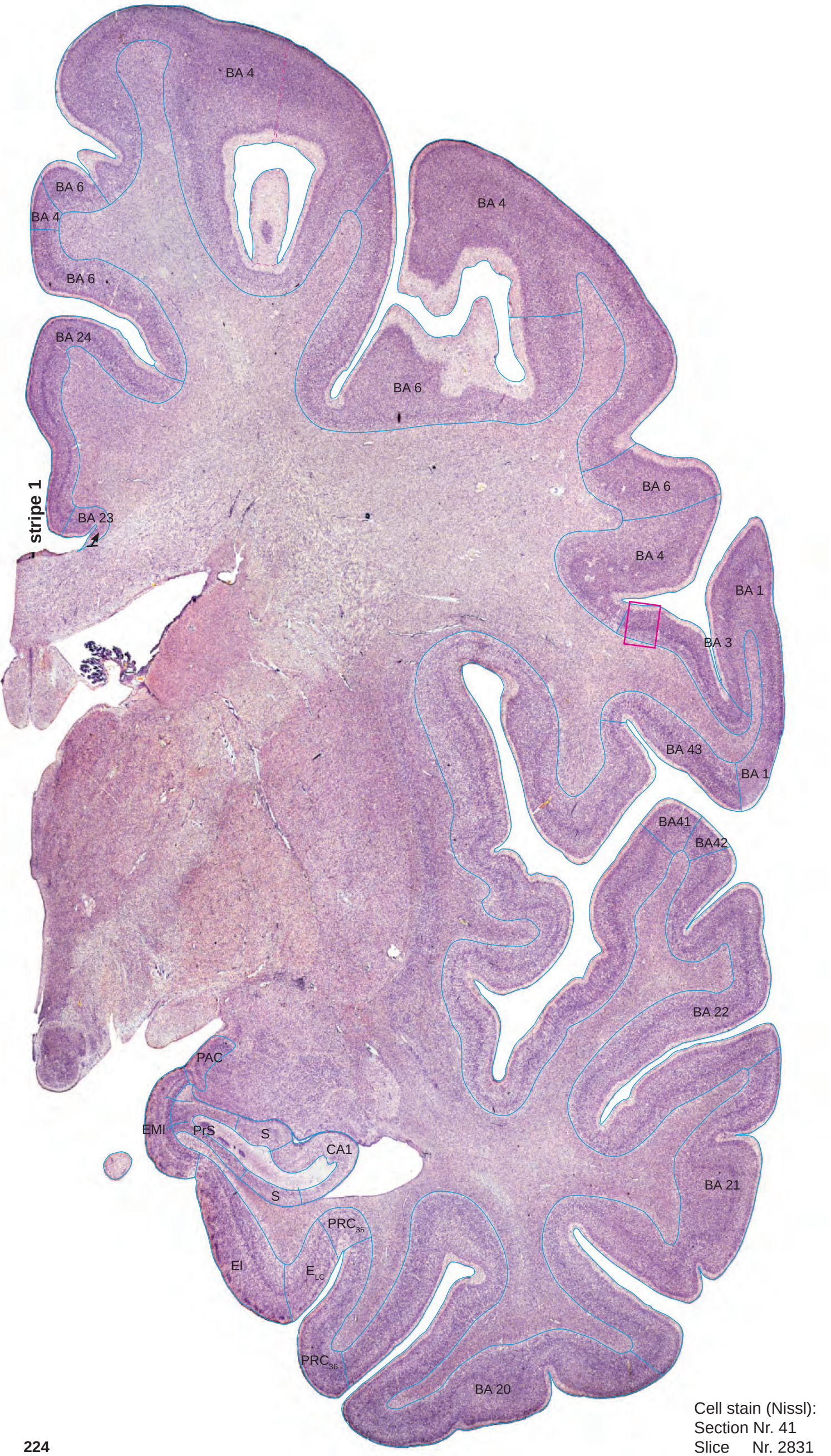
41

MNI: -9.66
ICL: 9.22
MCP: -5.52

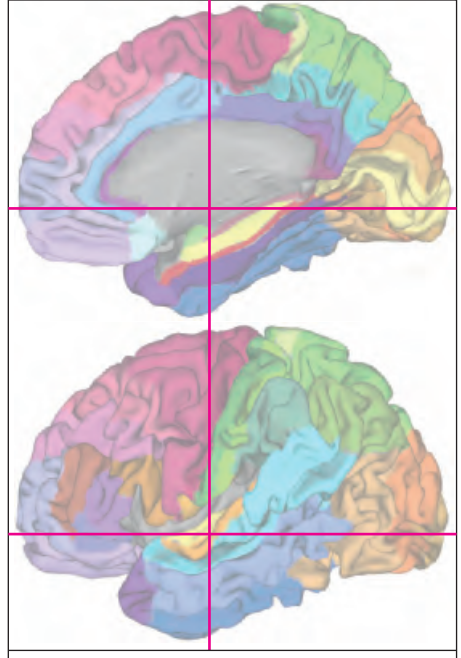


BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
ac anterior commissure
AD anterodorsal thalamic n.
AG ambiens gyrus
al ansa lenticularis
AM anteromedial thalamic n.
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
BLD basolateral amygdaloid n., dorsal p.
BLI basolateral amygdaloid n., intermediate p.
BLPL basolateral amygdaloid n., paralaminar p.
BLVL basolateral amygdaloid n., ventrolateral p.
BLVM basolateral amygdaloid n., ventromed. p.
BM basomedial amygdaloid n.
CA1 CA1 field of hippocampus
Cd caudate n.
ce central sulcus
CeL central amygdaloid n, lat. p.
CeM central amygdaloid n, med. p.
CeMe central medial thalamic n.
cgs-p cingulate sulcus, posterior p.
CoCl compact insular claustrum
cos-ph collateral sulcus, parahippocampal r.
DCl dorsal claustrum
DiCl diffuse insular claustrum
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
EMI entorhinal cortex, medial intermed. subfield
eml external medullary lamina of the thalamus
EP entopeduncular n.
Fa fasciculosus n.
fx fornix
h2 lenticular fascicle
icml incomplete medullary lamina of gl. pallidus
IGP internal globus pallidus
IGr indusium griseum
iml internal medullary lamina of the thalamus
IThA interthalamic adhesion
its inferior temporal sulcus
La lateral amygdaloid n.
lenf lenticular fasciculus
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
LM lateral mammillary n.
lml lateral medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
mfb medial forbrain bundle
ML medial mammillary n., lat. p.
MM medial mammillary n., med. p.
mml medial medullary lamina of globus pallidus
PAC periamygdaloid cortex
pacs paracentral sulcus
PalHy pallidohypothalamic n.
PCo post. cortical amygdaloid n.
PedL peduncle of lentiform n.
PH posterior hypothalamic area
pm principal mammillary fasciculus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
S subiculum
sas semiannular sulcus
sfs superior frontal sulcus
sm stria medullaris of thalamus
sprs superior precentral sulcus
st stria terminalis
sts superior temporal sulcus
SuM supramammillary n.
TLV temporal horn of lateral ventricle
TM tuberomammillary n.
tsv thalamostriate vein
unn uncal notch
VA ventroanterior n. (ventral anterior n.)
VAL lateral ventroanterior n. (pallidal afferents)
VGP ventral pallidum
ZI zona incerta



Cell stain (Nissl):
Section Nr. 41
Slice Nr. 2831



MNI Position y = -9.60 mm
AHB Position y = 9.14 mm

Gyral Pattern

CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FOp frontal operculum
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MFG middle frontal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PPo planum polare
PPo-l planum polare, lat. part
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial part
SLG semilunar gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

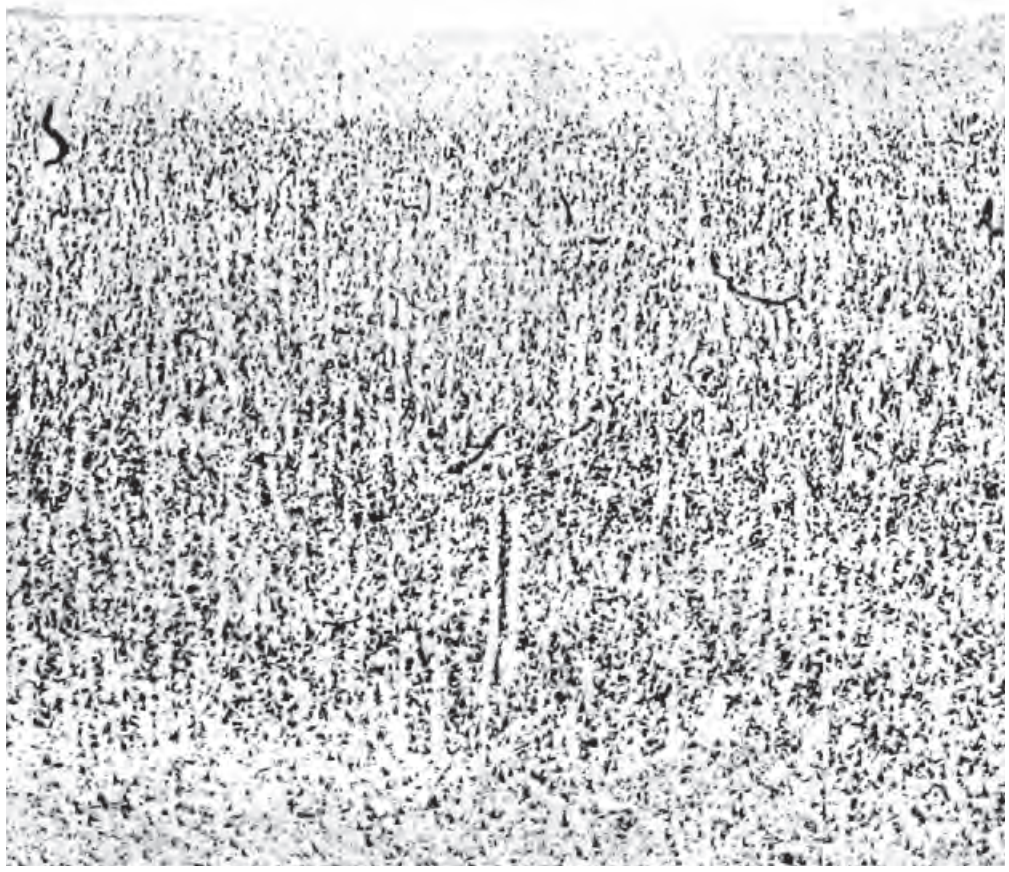
BA1 area postcentralis intermedia
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

von Economo and Koskinas

FA precentral area
FB agranular frontal area
FC intermediate frontal area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
La precingulate agranular anterior limbic area
La2 anterior cingulate agranular anterior limbic area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TG temporo polar area

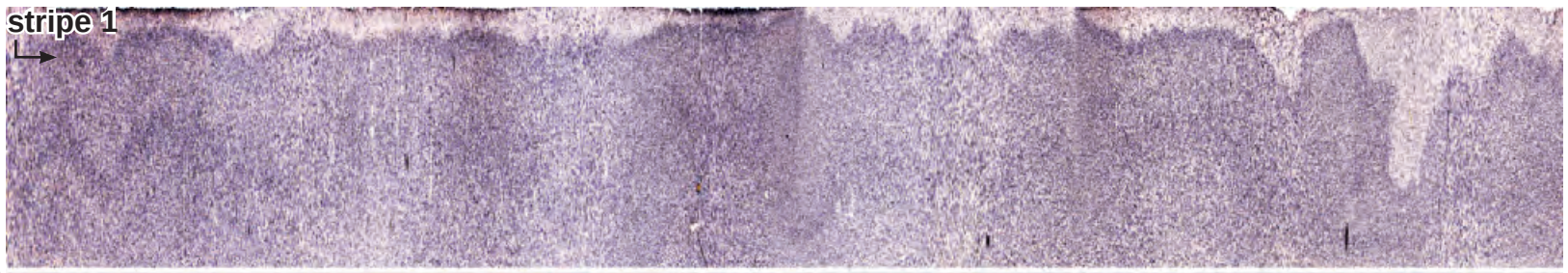
Regions of Interest

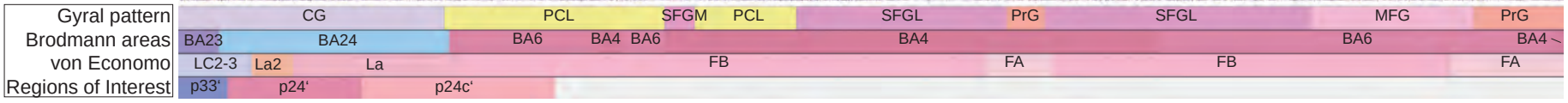
B. Vogt:
p24c‘ anterior division of BA24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

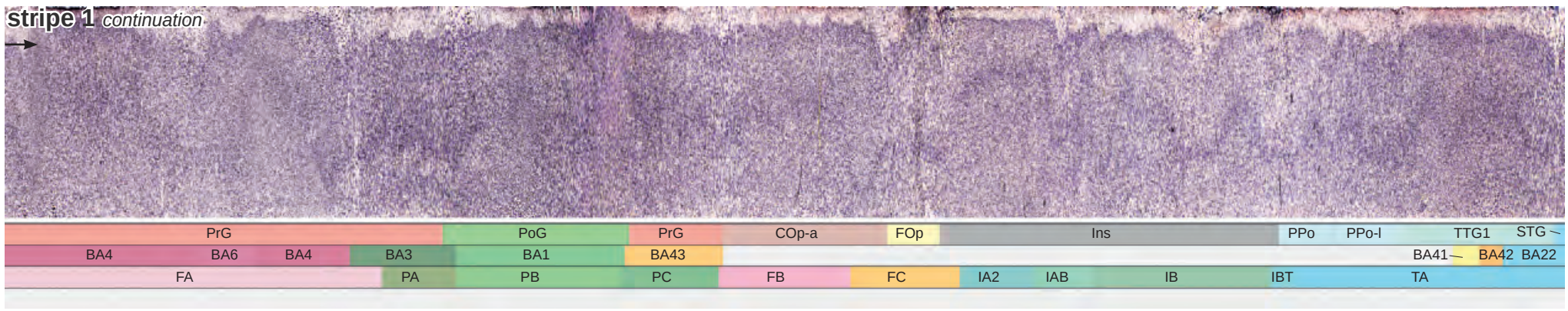


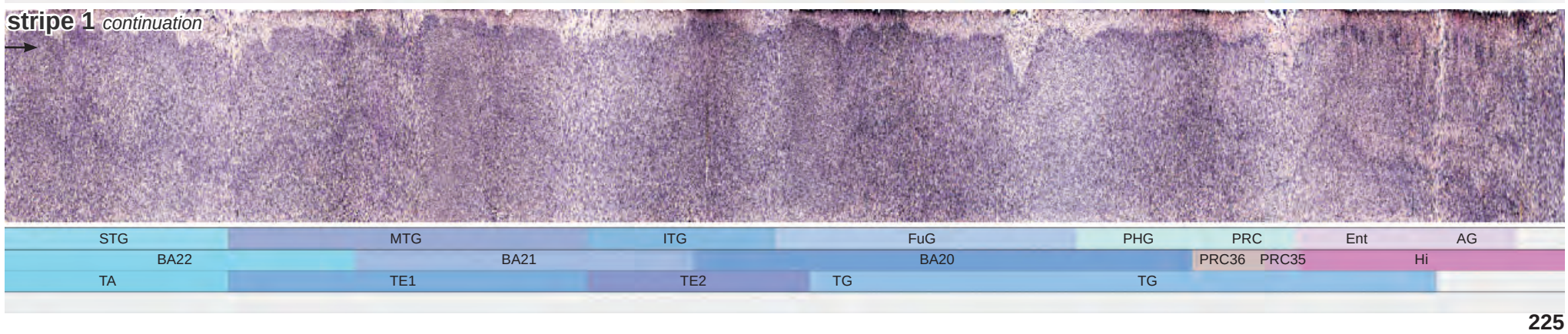
PB1 Area postcentralis oralis granulosa

von Economo and Koskinas (1925) Plate LIX (59)

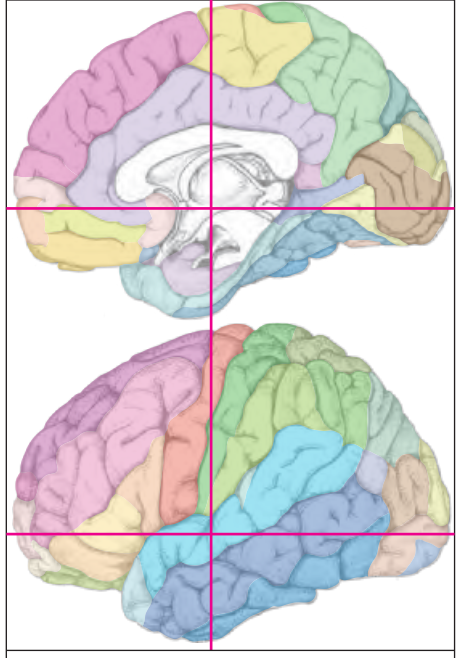








Cortex: Gyri and Sulci



MNI Position y = -10.95 mm
AHB Position y = 10.56 mm

Gyri

CG cingulate gyrus
COp-a anterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
PPo planum polare
SFGL superior frontal gyrus, lateral part
SLG semilunar gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

acus sulcus acusticus
ascs anterior subcentral sulcus
cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
rhs rhinal sulcus
sas semiannular sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
unn uncal notch

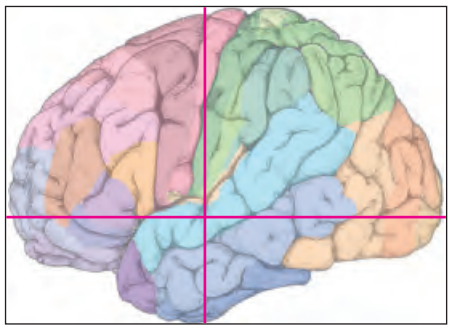
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
gic genu of internal capsule
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
liml limiting medullary lamina of globus pallidus
lls lateral longitudinal stria
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mp mammillary peduncle
mtg mammillotegmental tract
opt optic tract
racc radiation of corpus callosum
scr superior corona radiata
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
tp tapetum
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 42
Slice Nr. 2884

Cortex: Brodmann Areas

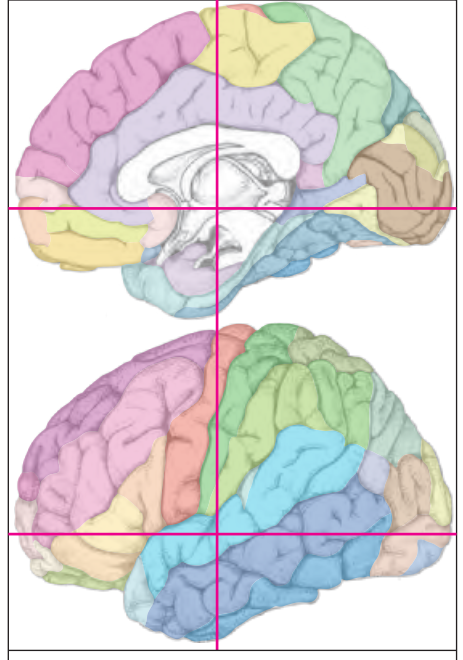
MNI: -10.95
ICL: 10.56
MCP: -4.18



BA1-52 Brodmann areas 1-52 (see p. 101)

ac anterior commissure
AD anterodorsal thalamic n.
AHi amygdalohippocampal area
ASt amygdalostriatal transition area
al ansa lenticularis
AM anteromedial thalamic n.
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
BLD basolateral amygdaloid n., dorsal p.
BLI basolateral amygdaloid n., intermediate p.
BLPL basolateral amygdaloid n., paralaminar p.
BLVL basolateral amygdaloid n., ventrolateral p.
BMCM basomedial amygd. n., centromedial p.
BMDL basomedial amygd. n., dorsolateral p.
BMDM basomedial amygd. n., dorsomedial p.
BMVM basomedial amygd. n., ventromedial p.
CA1 CA1 field of hippocampus
Cd caudate n.
ce central sulcus
CeL central amygdaloid n, lat. p.
CeM central amygdaloid n, med. p.
CoCl compact insular claustrum
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
DiCl diffuse insular claustrum
dPrS dorsal presubiculum
du diverticulum unci
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
eml external medullary lamina of the thalamus
EP entopeduncular n.
Fa fasciculosus n.
h2 lenticular fascicle
HATA hippocampo amygdaloid transitional area
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
IThA interthalamic adhesion
ithp inferior thalamic peduncle
La lateral amygdaloid n.
lenf lenticular fasciculus
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
liml limiting medullary lamina of globus pallidus
LM lateral mammillary n.
lml lateral medullary lamina of . globus pallidus
maprs marginal precentral sulcus
Me medial amygdaloid n.
mfb medial forbrain bundle
ML medial mammillary n., lat. p.
MM medial mammillary n., med. p.
mml medial medullary lamina of . globus pallidus
mt mammillothalamic tract
PalHy pallidohypothalamic n.
PCo post. cortical amygdaloid n.
PedL peduncle of lentiform n.
PH posterior hypothalamic area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
prf principal fc
PrS presubiculum
PT paratenial thalamic n.
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
S subiculum
SB striatal cell bridge
sm stria medullaris of thalamus
sprs superior precentral sulcus
st stria terminalis
SuM supramammillary n.
TM tuberomammillary n.
tsv thalamostriate vein
tt tenia of thalamus
unc uncinate fc
VAL lateral ventroanterior n. (pallidal afferents)
VAM medial ventroanterior n. (nigral afferents)
VAMC magnocellular ventroanterior n.
VCl ventral claustrum
VGP ventral globus pallidus
ZI zona incerta

Cortex: Gyri and Sulci



MNI Position y = -12.67 mm
AHB Position y = 12.09 mm

Fiber stain (Weigert)
Section Nr. 43
Slice Nr. 2941

Gyri

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SLG semilunar gyrus
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs-p cingulate sulcus, post. part
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
pscs posterior subcentral sulcus
rhs rhinal sulcus
sas semiannular sulcus
sH Heschl sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
unn uncal notch

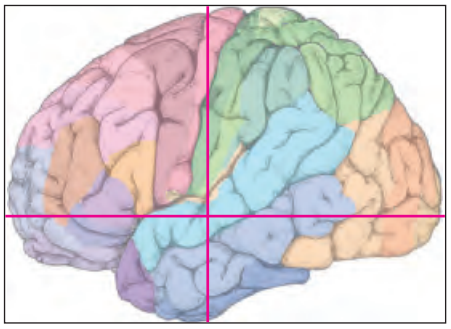
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
ec external capsule
eml external medullary lamina of the thalamus
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
lls lateral longitudinal stria
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mp mammillary peduncle
mt mammillothalamic tract
mtg mammillotegmental tract
opt optic tract
pic posterior limb of the internal capsule
prf principal fc
racc radiation of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
tp tapetum
unc uncinate fascicle

Cortex: Brodmann Areas

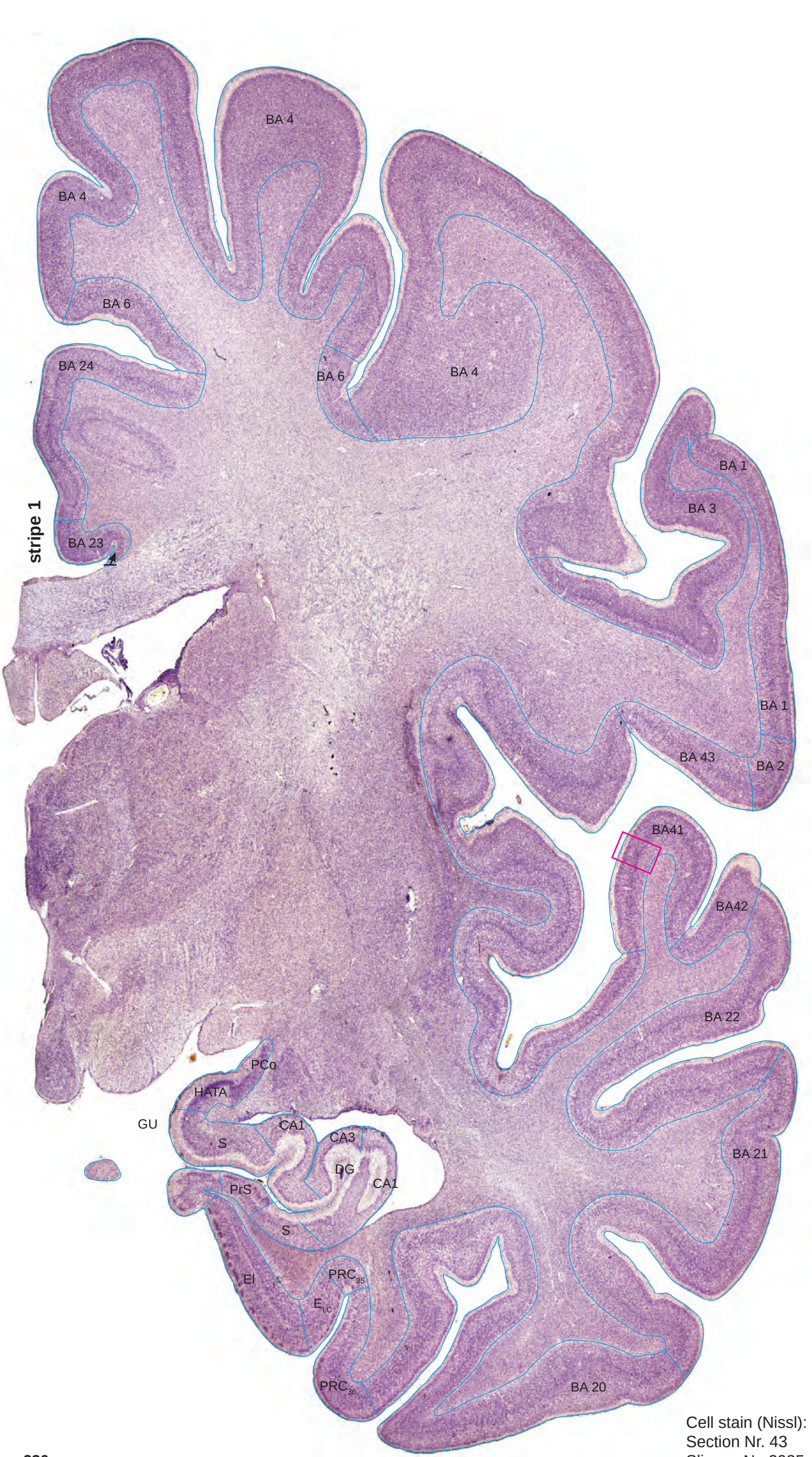
43

MNI: -12.67
ICL: 12.09
MCP: -2.65

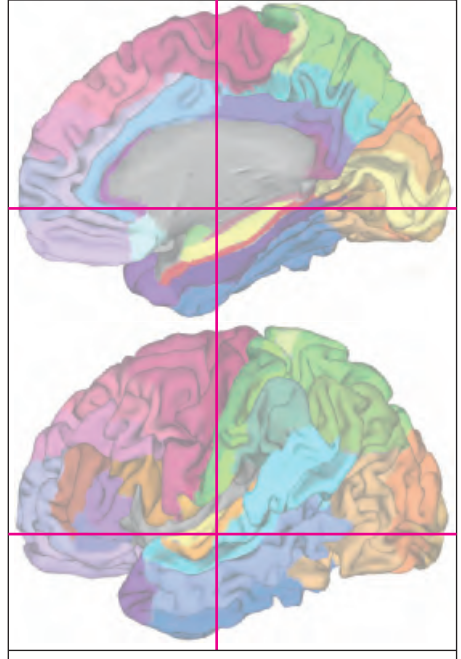


BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
3V third ventricle
AHi amygdalohippocampal area
al ansa lenticularis
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact p.
bfx body of fornix
BL basolateral amygdaloid n.
BM basomedial amygdaloid n.
CA1 CA1 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
ce central sulcus
CeL central amygdaloid n, lat. p.
CeM central amygdaloid n, med. p.
CeMe central medial thalamic n.
cgs-p cingulate sulcus, posterior p.
Co commissural n.
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
Cuc cucullaris n.
DCl dorsal claustrum
DG dentate gyrus
DiCl diffuse insular claustrum
EGP external globus pallidus
El entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
eml external medullary lamina of the thalamus
gic genu of corpus callosum
GU gyrus uncinate
h2 lenticular fascicle
HATA hippocampo amygdaloid transitional area
hf hippocampal fissure
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of globus pallidus
LV lateral ventricle
maprs marginal precentral sulcus
MD medial dorsal thalamic n.
Me medial amygdaloid n.
mfb medial forbrain bundle
MM medial mammillary n., med. p.
mml medial medullary lamina of globus pallidus
mt mammillothalamic tract
mtg mammillo-tegmental tract
opt optic tract
pacs paracentral sulcus
PCo post. cortical amygdaloid n.
PedL peduncle of lentiform n.
PH posterior hypothalamic area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
prf principal fc
PrS presubiculum
PT paratenial thalamic n.
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
SEpS subependymal stratum
sm stria medullaris of thalamus
SNR substantia nigra, pars reticulata
sprs superior precentral sulcus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
unn uncal notch
VA ventroanterior n. (ventral anterior n.)
VAL lateral ventroanterior n. (pallidal afferents)
VAMC magnocellular ventroanterior n.
VCl ventral claustrum
VL ventrolateral n.
VP ventral pallidum
ZI zona incerta



Cell stain (Nissl):
Section Nr. 43
Slice Nr. 2935



MNI Position y = -12.52 mm
AHB Position y = 11.93 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SLG semilunar gyrus
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

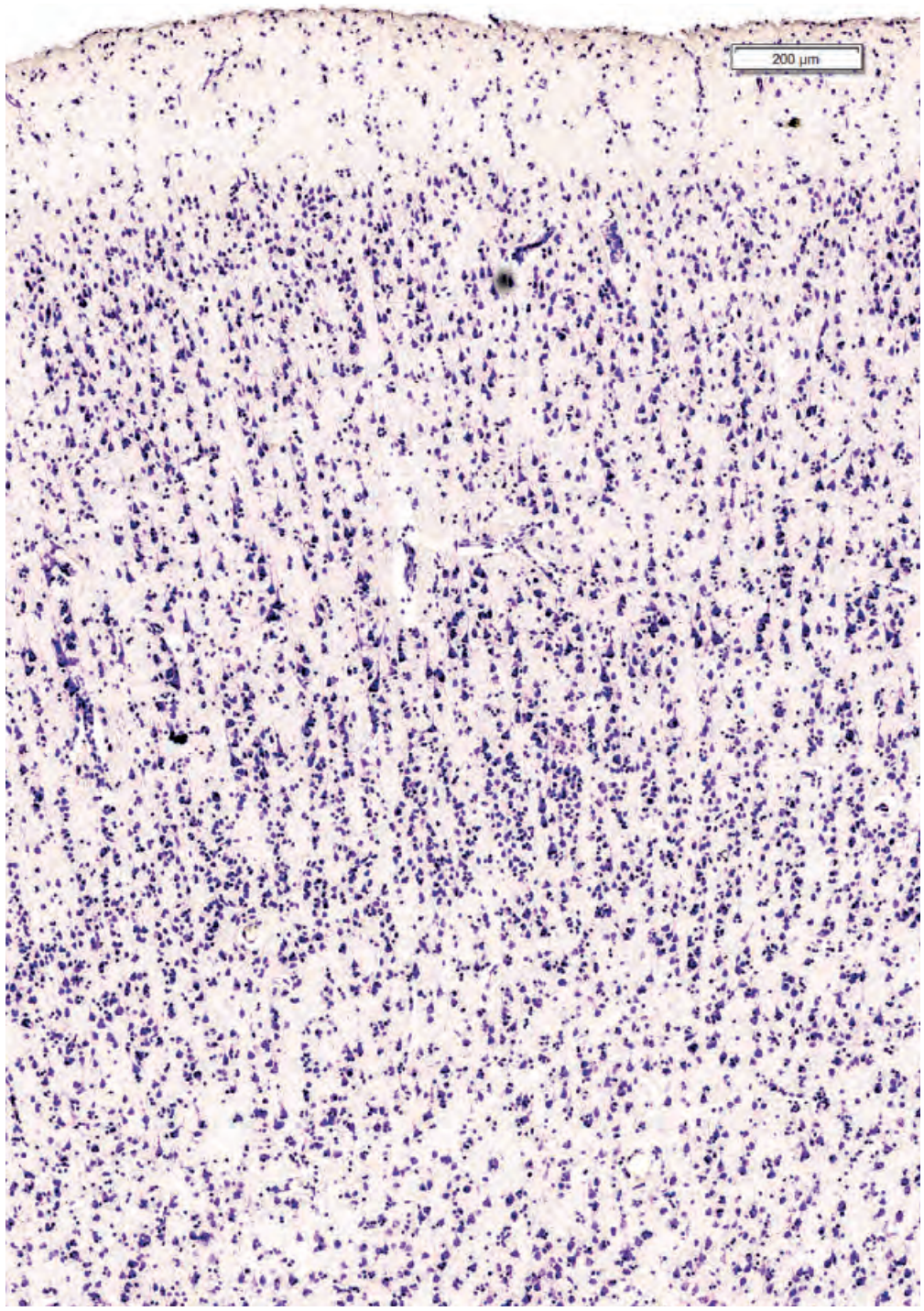
BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

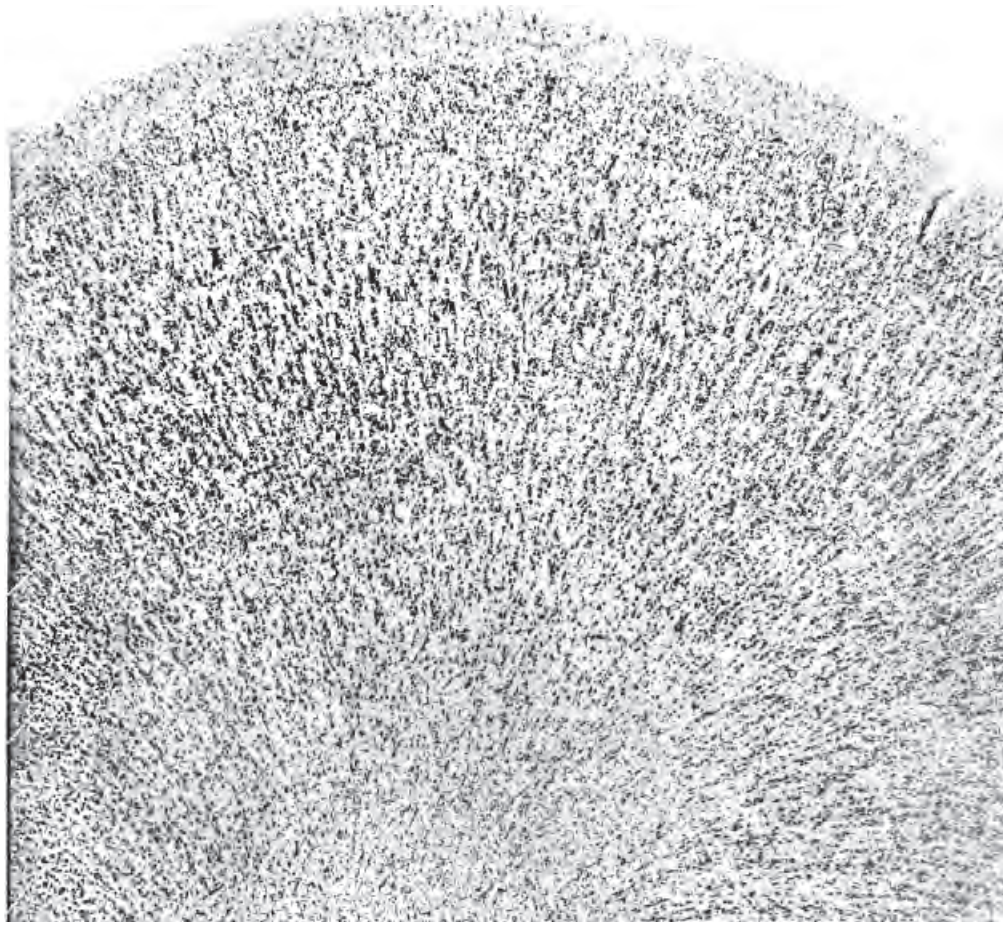
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TG temporo polar area

Regions of Interest

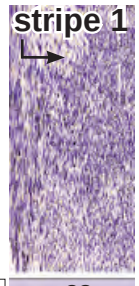
B. Vogt:
p24c' anterior division of BA24
p24' anterior division of BA24
p33' posterior subregion of BA33



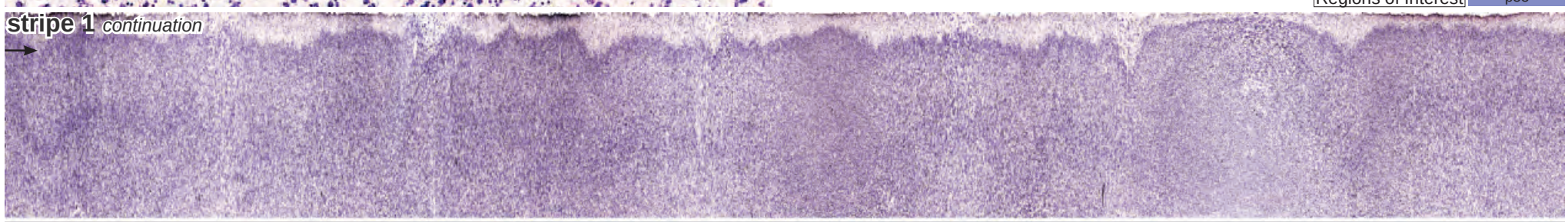


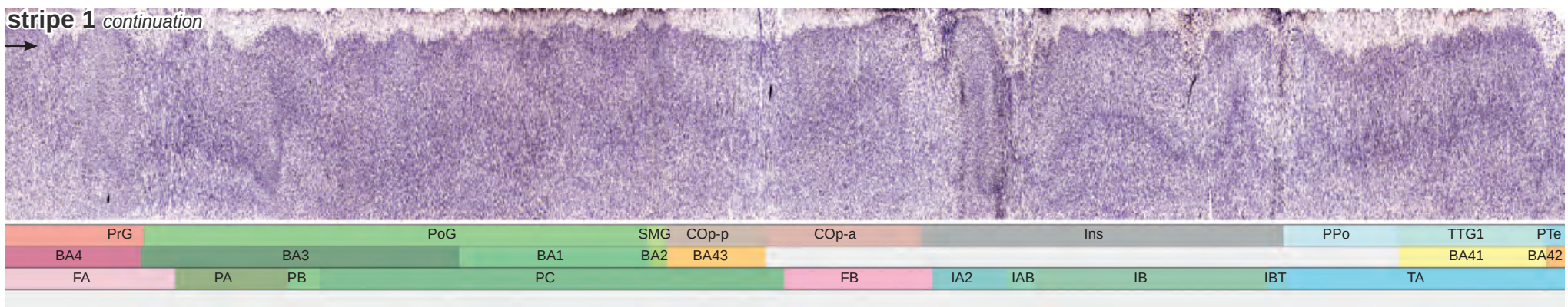
TD Area supratemporalis intercalata.

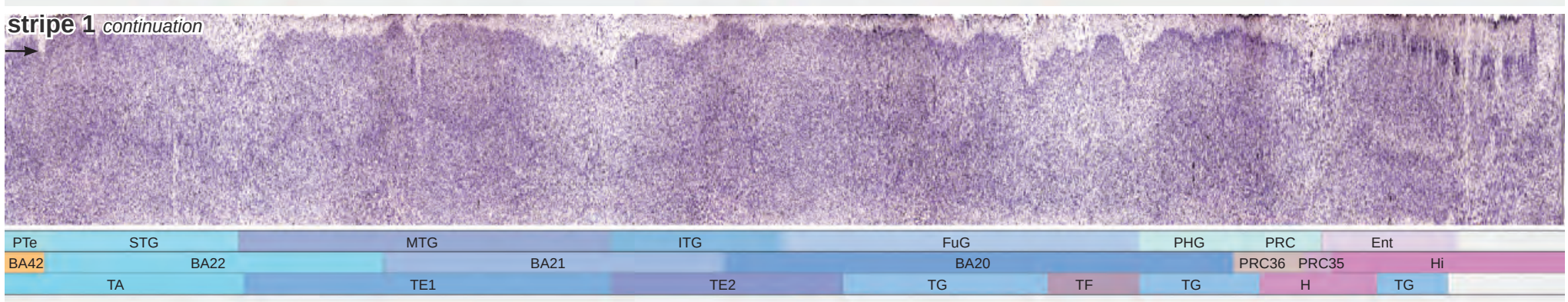
von Economo and Koskinas (1925) Plate XCV (95)



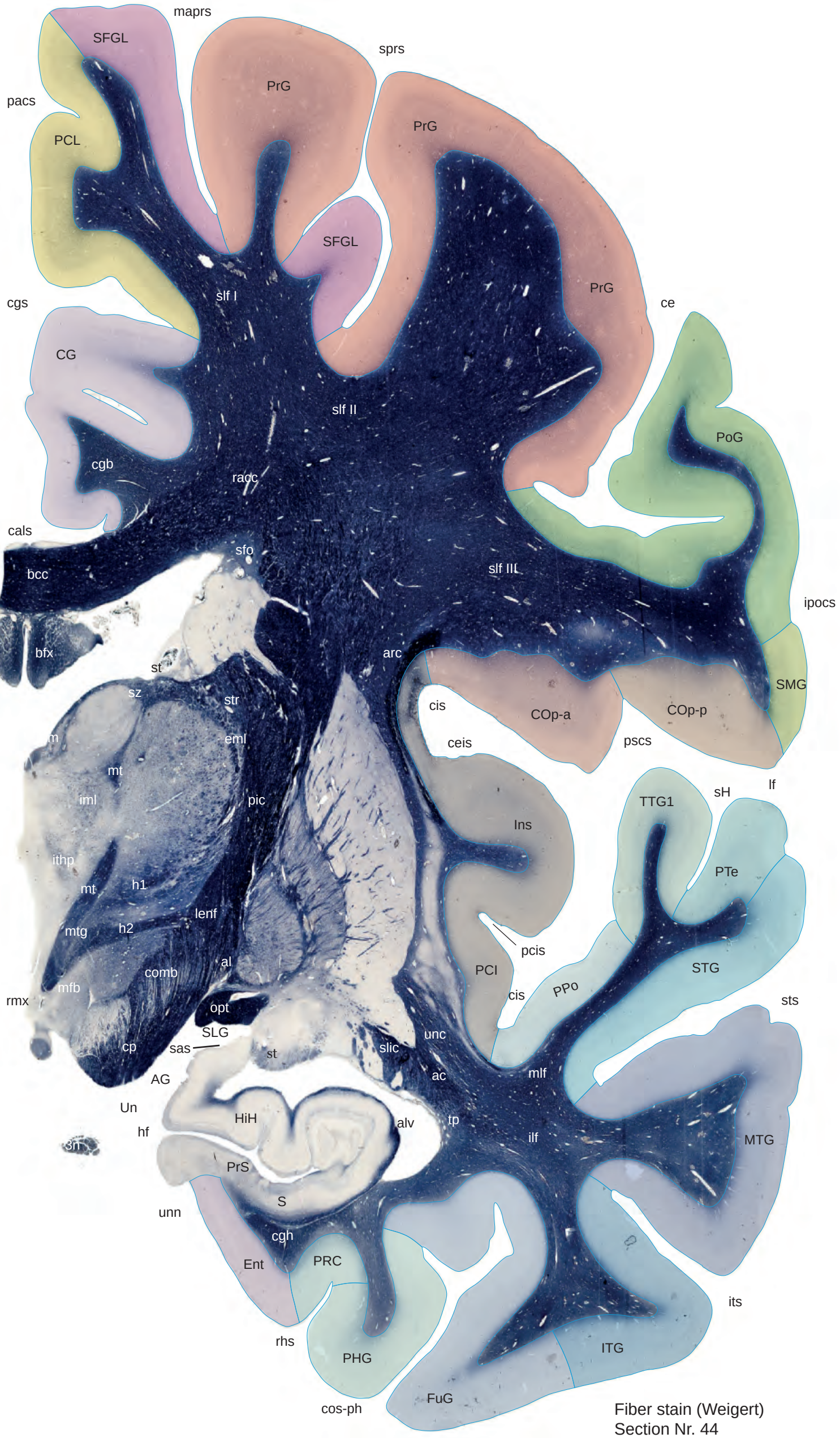
Gyral pattern	CG
Brodmann areas	BA23
von Economo	LC2-3
Regions of Interest	p33'

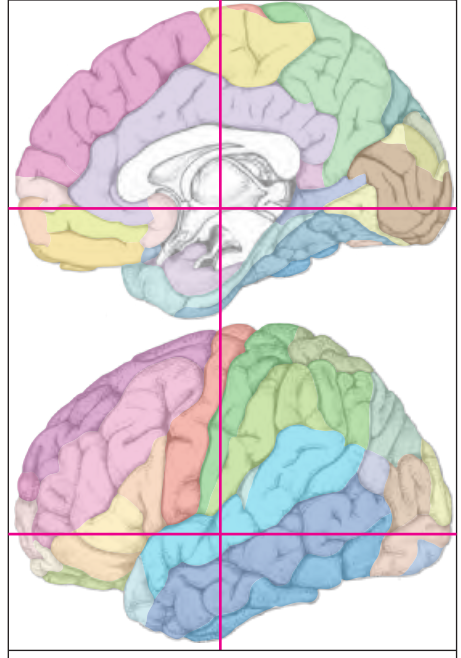






Cortex: Gyri and Sulci





MNI Position y = -13.99 mm
AHB Position y = 13.35 mm

Gyri

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
HiH hippocampal head
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SLG semilunar gyrus
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
ceis central insular sulcus
cgs cingulate sulcus
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
pscs posterior subcentral sulcus
rhs rhinal sulcus
sas semiannular sulcus
sH Heschl sulcus
sprs superior precentral sulcus
sts superior temporal sulcus
unn uncal notch

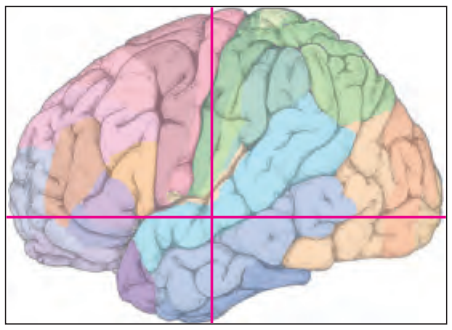
Fibers

3n oculomotor nerve
ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
eml external medullary lamina of the thalamus
h1 thalamic fascicle
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mt mammillothalamic tract
mtg mammillotegmental tract
opt optic tract
pic posterior limb of the internal capsule
racc radiation of corpus callosum
rmx retromammillary commissure
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
sz stratum zonale
tp tapetum
unc uncinate fascicle

Fiber stain (Weigert)
Section Nr. 44
Slice Nr. 2988

Cortex: Brodmann Areas

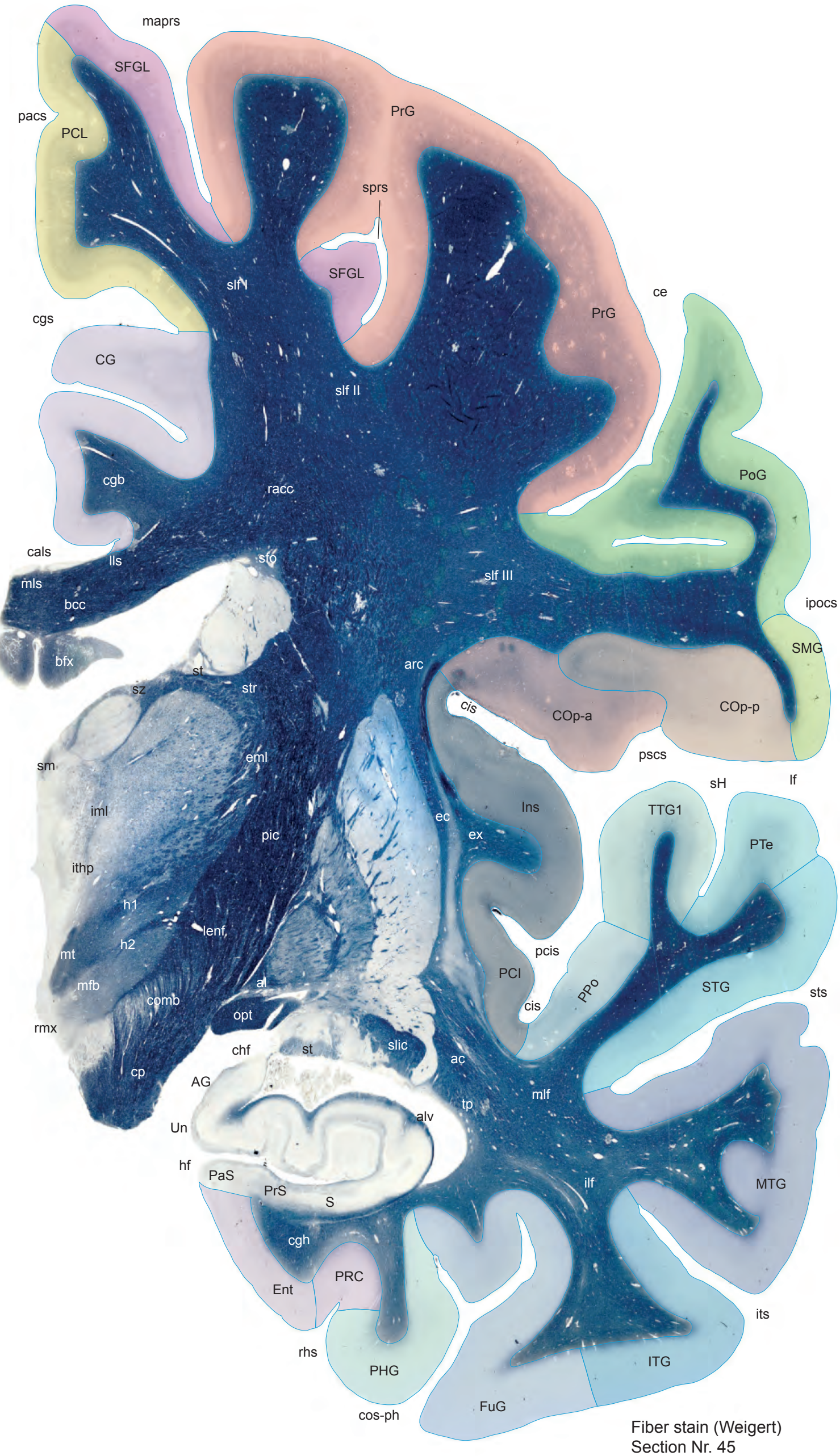
MNI: -13.99
ICL: 13.35
MCP: -1.39

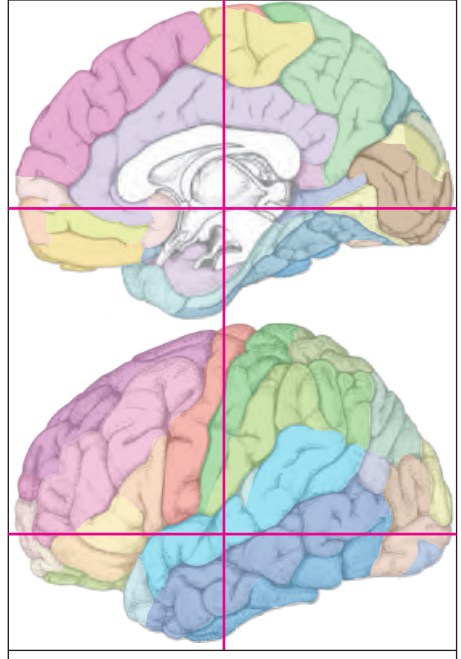


BA1-52 Brodmann areas 1-52 (see p. 101)

3V third ventricle
AD anterodorsal thalamic n.
al ansa lenticularis
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
BL basolateral amygdaloid n.
BM basomedial amygdaloid n.
CA1 CA1 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
ce central sulcus
CeL central amygdaloid n, lat. p.
CeM central amygdaloid n, med. p.
CeMe central medial thalamic n.
cgs-p cingulate sulcus, posterior p.
Co commissural n.
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
Cuc cucullaris n.
DCl dorsal claustrum
DG dentate gyrus
DiCl diffuse insular claustrum
EGP external globus pallidus
EI entorhinal cortex, intermediate subfield
ELC entorhinal cortex, lateral caudal subfield
eml external medullary lamina of the thalamus
H H-field of Forel
h1 thalamic fascicle
h2 lenticular fascicle
HATA hippocampo amygdaloid transitional area
hf hippocampal fissure
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
irs intrarhinal sulcus
ithp inferior thalamic peduncle
its inferior temporal sulcus
lenf lenticular fasciculus
lf lateral (Sylvian) fissure
LH lateral hypothalamic area
LiCl limitans claustrum
lml lateral medullary lamina of globus pallidus
LV lateral ventricle
maprs marginal precentral sulcus
MD medial dorsal thalamic n.
Me medial amygdaloid n.
MM medial mammillary n., med. p.
mml medial medullary lamina of globus pallidus
mt mammillothalamic tract
mtg mammillo-tegmental tract
pacs paracentral sulcus
PedL peduncle of lentiform n.
PH posterior hypothalamic area
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
prf principal fc
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
rmx retromammillary commissure
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
sprs superior precentral sulcus
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
VAb basal ventroanterior n.
VAL lateral ventroanterior n. (pallidal afferents)
VAM medial ventroanterior n. (nigral afferents)
VAMC magnocellular ventroanterior n.
VLA anterior ventrolateral n. (medial oral div.)
VGP ventral globus pallidus
ZI zona incerta

Cortex: Gyri and Sulci





MNI Position y = -15.51 mm
AHB Position y = 14.74 mm

Fiber stain (Weigert)
Section Nr. 45
Slice Nr. 3040

Gyri

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

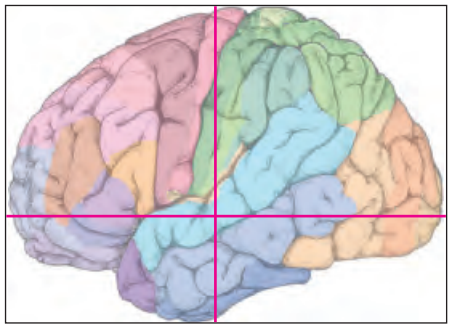
cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
pscs posterior subcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sprs superior precentral sulcus
sts superior temporal sulcus

Fibers

ac anterior commissure
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
h1 thalamic fascicle
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ithp inferior thalamic peduncle
lenf lenticular fasciculus
lls lateral longitudinal stria
mfb medial forbrain bundle
mlf middle longitudinal fascicle
mls medial longitudinal stria
mt mammillothalamic tract
opt optic tract
pic posterior limb of the internal capsule
racc radiation of corpus callosum
rmx retromammillary commissure
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
sz stratum zonale
tp tapetum

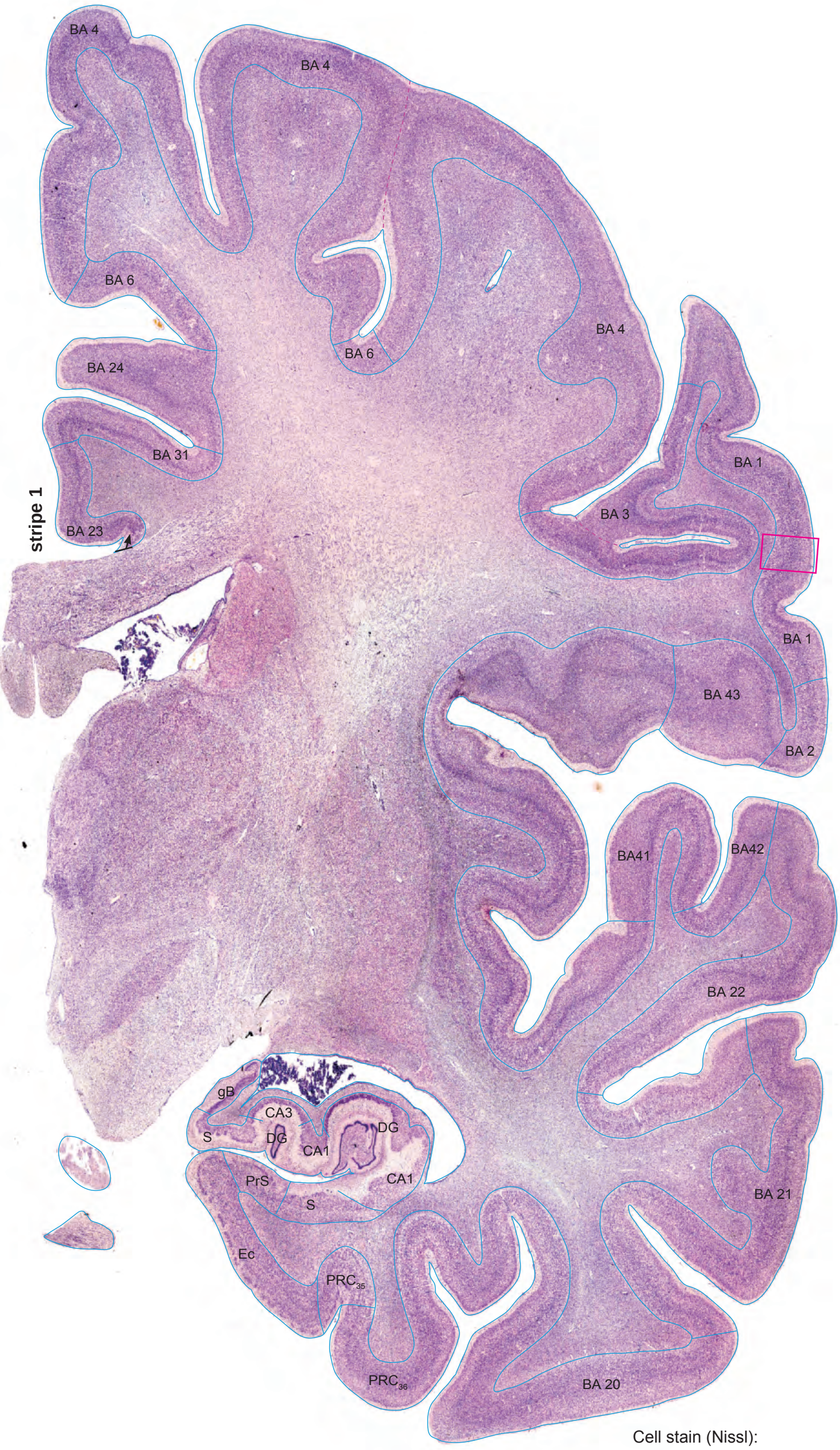
Cortex: Brodmann Areas

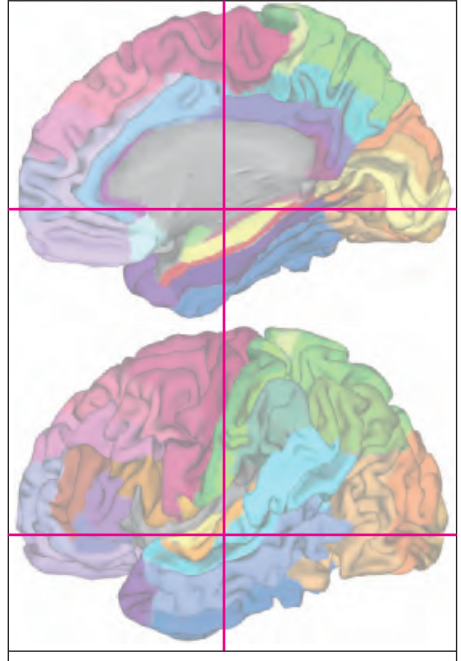
MNI: -15.51
ICL: 14.74
MCP: 0.00



BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
3V third ventricle
ac anterior commissure
AD anterodorsal thalamic n.
al ansa lenticularis
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
bG band of Giacomini
CA1 CA1 field of hippocampus
CA3 CA3 field of hippocampus
cals callosal sulcus
cc corpus calosum
Cd caudate n.
ce central sulcus
Ce central amygdaloid n.
CeMe central medial thalamic n.
cgs cingulate sulcus
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
Cuc cucullaris n.
DG dentate gyrus
Ec entorhinal cortex, caudal subfield
EGP external globus pallidus
eml external medullary lamina of the thalamus
h1 thalamic fascicle
h2 lenticular fascicle
hf hippocampal fissure
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
ipocs inferior postcentral sulcus
ithp inferior thalamic peduncle
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lls lateral longitudinal stria
lml lateral medullary lamina of globus pallidus
LV lateral ventricle
maprs marginal precentral sulcus
MD medial dorsal thalamic n.
MDMC mediodorsal thalamic n., magnocell. p.
Me medial amygdaloid n.
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
mtg mammillo-tegmental tract
opt optic tract
pacs paracentral sulcus
pic posterior limb of the internal capsule
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
prf principal fc
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuLi limitans putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
rmx retromammillary commissure
Rt reticular thalamic n.
S subiculum
SB striatal cell bridge
SEpS subependymal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
sprs superior precentral sulcus
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
Un uncus
VAb basal ventroanterior n.
VAL lateral ventroanterior n. (pallidal afferents)
VAMC magnocellular ventroanterior n.
VCl ventral claustrum
VGP ventral globus pallidus
VLA anterior ventrolateral n. (medial oral div.)
VLPE posterior ventrolateral n., external p.
vt velum terminale
VTA ventral tegmental area
ZI zona incerta





MNI Position y = -15.53 mm
AHB Position y = 14.77 mm

Gyral Pattern

AG ambiens gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA31 area cingularis posterior dorsalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

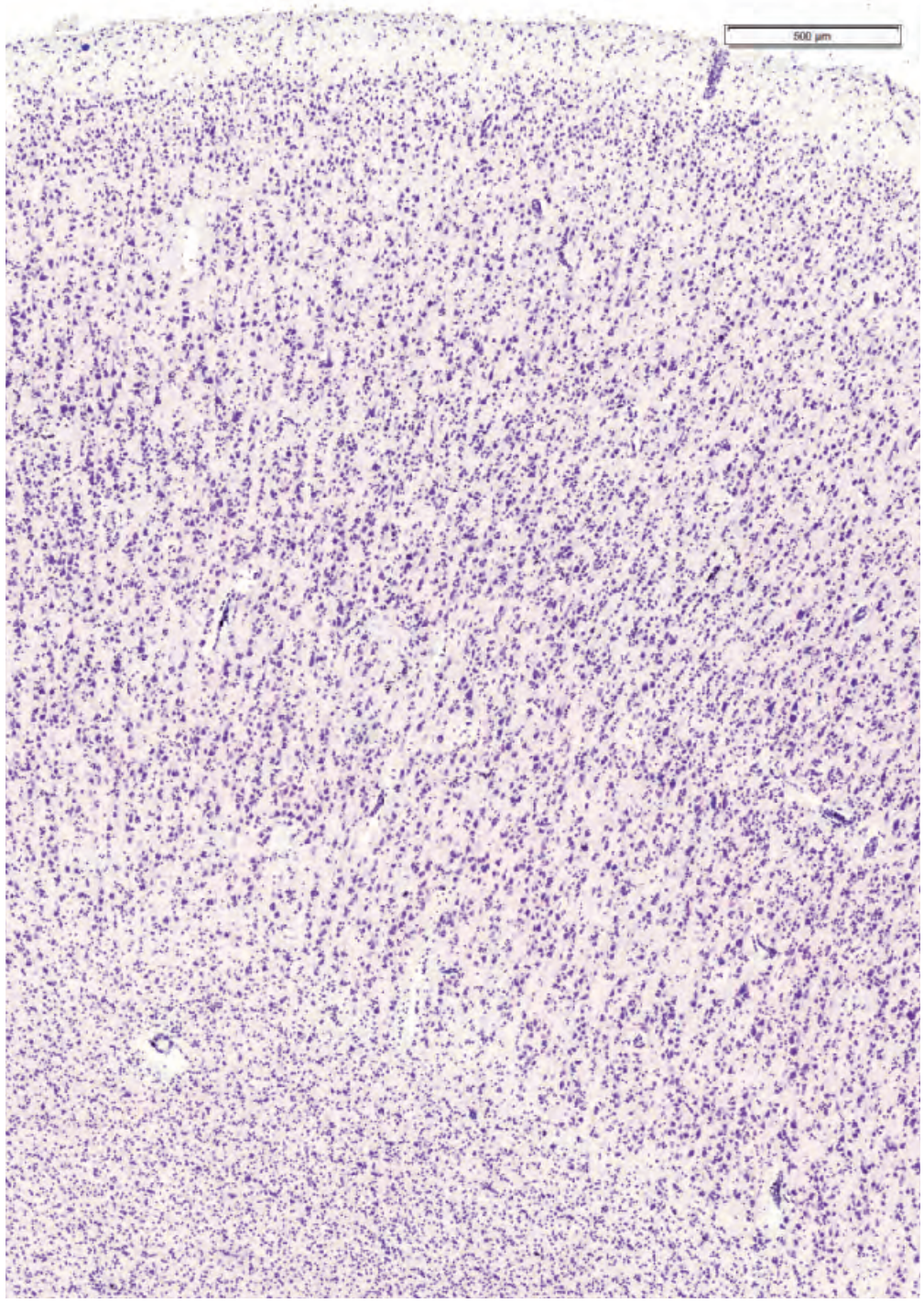
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
IA2 ventral precentral insular area
IAB insular transition area
IB postcentral insular area
IBT postcentral insular area at temporal entrance
LA precingulate agranular anterior limbic area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TG temporo polar area

Regions of Interest

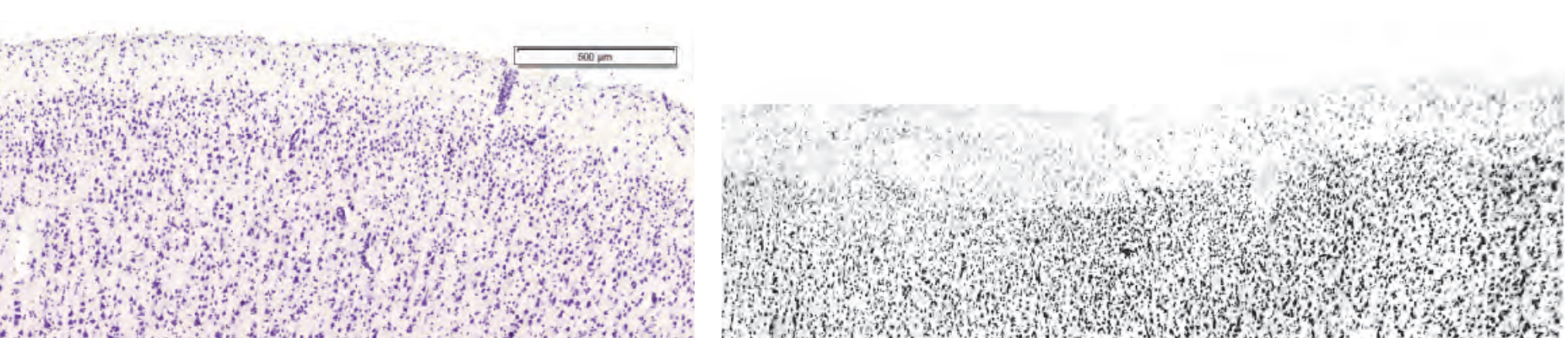
B. Vogt:
24d subregion of BA 24
p24c‘ anterior division of BA24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

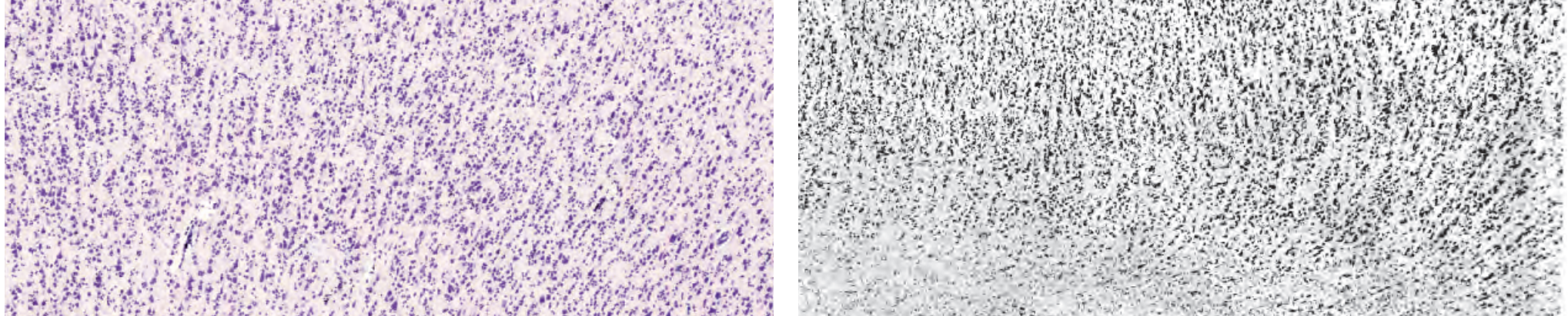
Cell stain (Nissl):
Section Nr. 45
Slice Nr. 3041

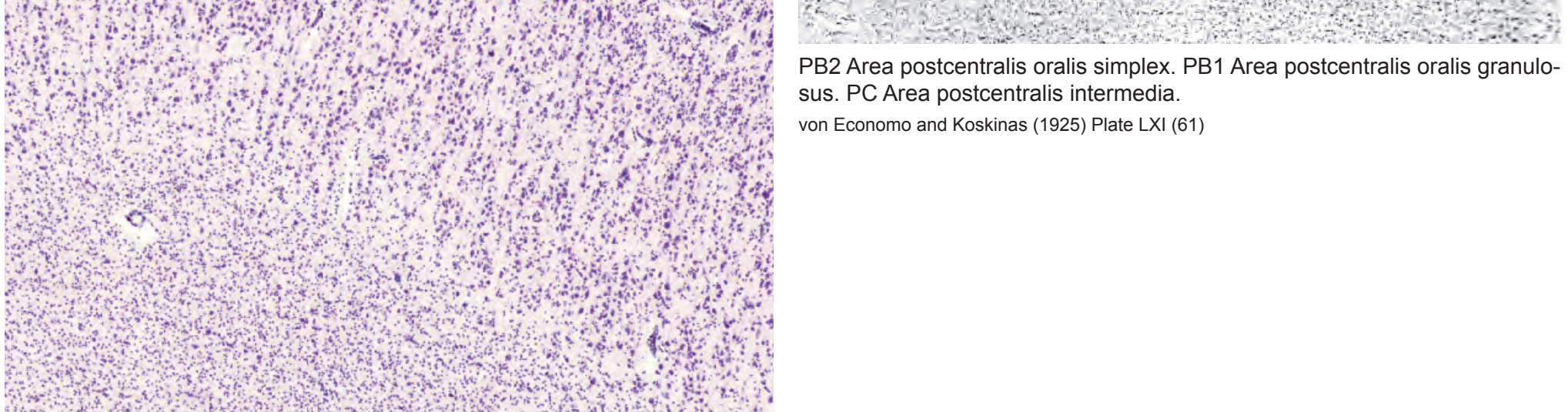


PB2 Area postcentralis oralis simplex. PB1 Area postcentralis oralis granulosus. PC Area postcentralis intermedia.

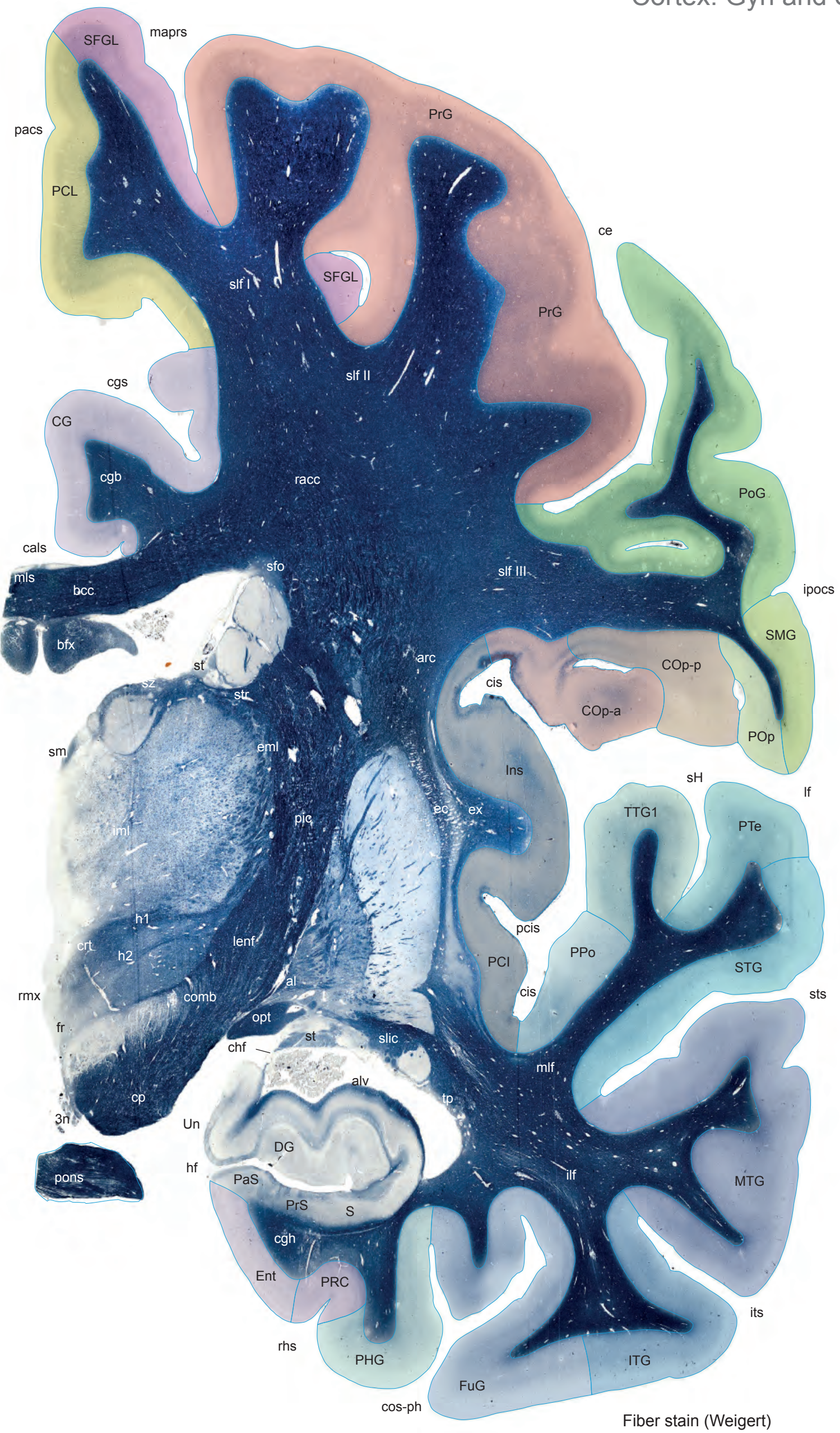
von Economo and Koskinas (1925) Plate LXI (61)

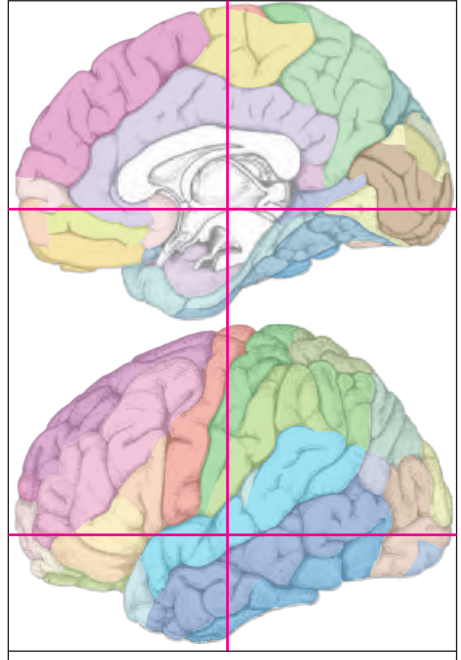






Cortex: Gyri and Sulci





MNI Position y = -16.83 mm
AHB Position y = 16.11 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
maprs marginal precentral sulcus
pacs paracentral sulcus
pcis posterior central insular sulcus
ipocs inferior postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

Fibers

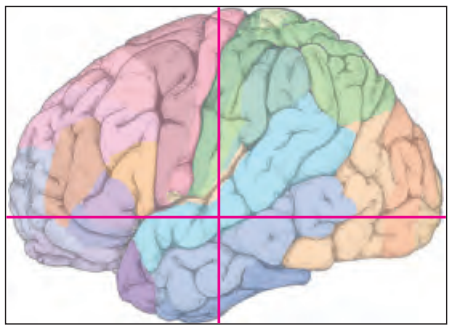
3n oculomotor nerve
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
lenf lenticular fasciculus
mlf middle longitudinal fascicle
mls medial longitudinal stria
opt optic tract
pic posterior limb of the internal capsule
pons pontine fibers
racc radiation of corpus callosum
rmx retromammillary commissure
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
sz stratum zonale
tp tapetum

Fiber stain (Weigert)
Section Nr. 46
Slice Nr. 3091

Cortex: Brodmann Areas

46

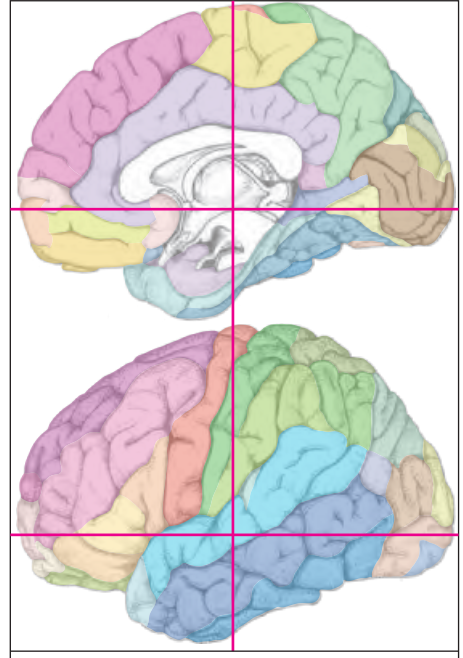
MNI: -16.83
ICL: 16.11
MCP: 1.37



BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
3V third ventricle
AD anterodorsal thalamic n.
al ansa lenticularis
Amg amygdala
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
bG band of Giacomini
CA1 CA1 field of hippocampus
CA3 CA3 field of hippocampus
cals callosal sulcus
cc corpus calosum
Cd caudate n.
ce central sulcus
CeMe central medial thalamic n.
cgs cingulate sulcus
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
cr capsule of the red n.
Cuc cucullaris n.
DG dentate gyrus
Ec entorhinal cortex, caudal subfield
ec external capsule
EGP external globus pallidus
eml external medullary lamina of the thalamus
ex extreme capsule
h1 thalamic fascicle
h2 lenticular fascicle
hf hippocampal fissure
IGP internal globus pallidus
iml internal medullary lamina of the thalamus
ipocs inferior postcentral sulcus
ithp inferior thalamic peduncle
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lml lateral medullary lamina of globus pallidus
LV lateral ventricle
maprs marginal precentral sulcus
MDMC mediodorsal thalamic n., magnocell. p.
MDPC mediodorsal thalamic n., parvicellular p.
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
mtg mammillo-tegmental tract
opt optic tract
pacs paracentral sulcus
pic posterior limb of the internal capsule
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
rmx retromammillary commissure
Rt reticular thalamic n.
S subiculum
SB striatal cell bridge
SEpS subependymal stria
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
tfi tenia of fimbria
tfx tenia of fornix
TLV temporal horn of lateral ventricle
tsc tenia semicircularis
tsv thalamostriate vein
tt tenia of thalamus
us uncal sulcus
VAb basal ventroanterior n.
VAL lateral ventroanterior n. (pallidal afferents)
VCl ventral claustrum
VGP ventral globus pallidus
VLA anterior ventrolateral n. (medial oral div.)
VLPE posterior ventrolateral n., external p.
VTA ventral tegmental area
ZI zona incerta

Cortex: Gyri and Sulci



MNI Position y = -18.30 mm
AHB Position y = 17.45 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
maprs marginal precentral sulcus
pcis posterior central insular sulcus
pcs postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

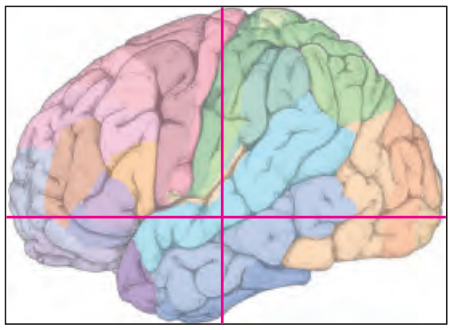
Fibers

3n oculomotor nerve
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
bG band of Giacomini
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
crt cerebello-rubro thalamic fibers
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fpt frontopontine tract
fr fasciculus retroflexus
h1 thalamic fascicle
h2 lenticular fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
lenf lenticular fasciculus
lls lateral longitudinal stria
mlf middle longitudinal fascicle
mls medial longitudinal stria
opt optic tract
pic posterior limb of the internal capsule
pons pontine fibers
ptpt parieto-temporopontine tract
py pyramidal tract
racc radiation of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
sz stratum zonale
tp tapetum

Fiber stain (Weigert)
Section Nr. 47
Slice Nr. 3141

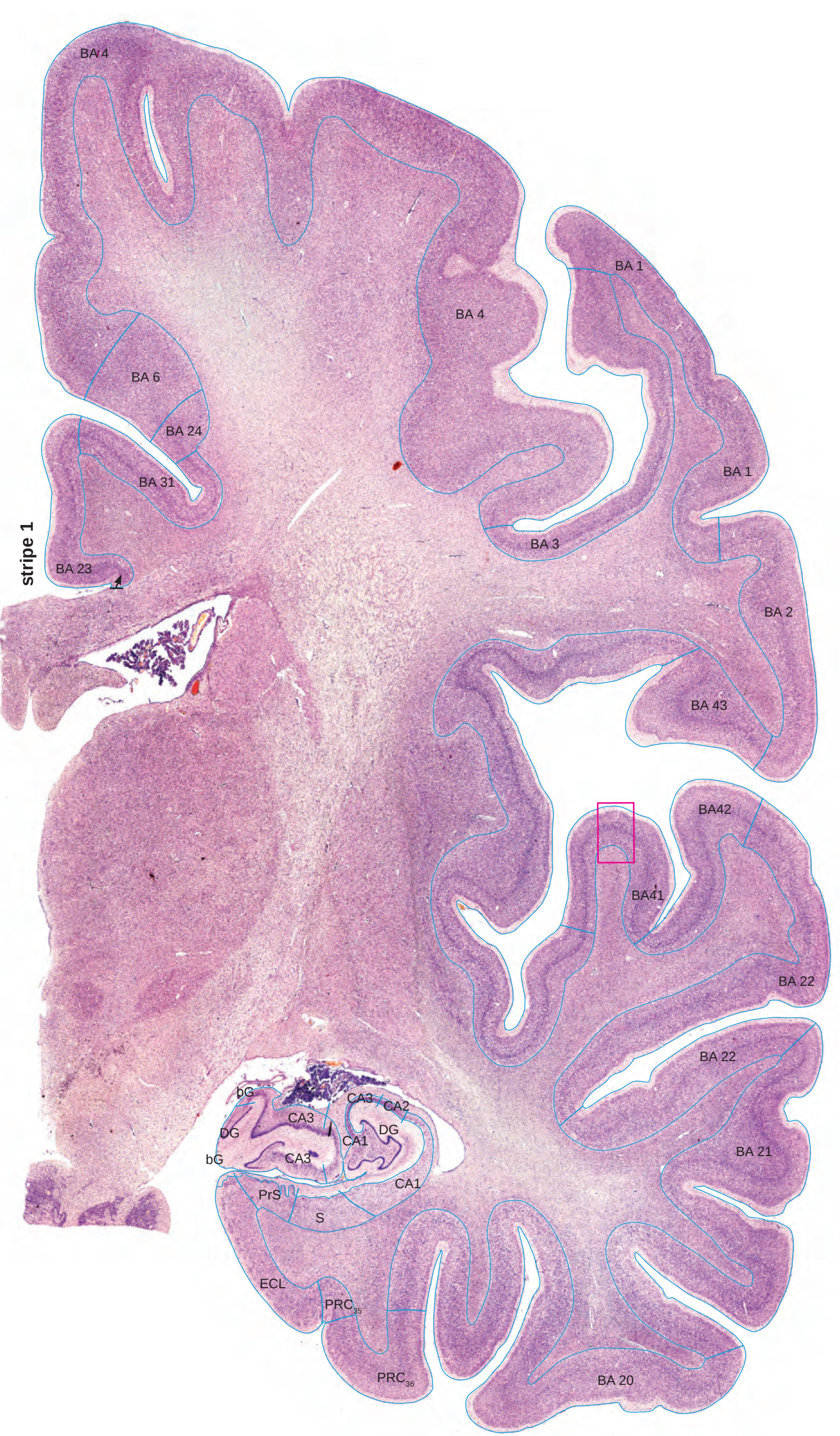
Cortex: Brodmann Areas

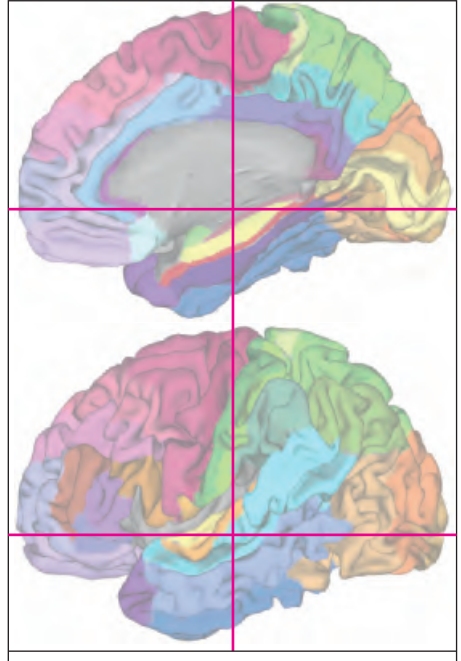
MNI: -18.30
ICL: 17.45
MCP: 2.71



BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
3V third ventricle
AD anterodorsal thalamic n.
al ansa lenticularis
Amg amygdala
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
bG band of Giacomini
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
cis circular sulcus
Co commissural n.
comb comb system
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
cr capsule of the red n.
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DCl dorsal claustrum
DG dentate gyrus
DSF dorsal superficial n.
ec external capsule
ECL entorhinal cortex, caudal limiting subfield
EGP external globus pallidus
eml external medullary lamina of the thalamus
ex extreme capsule
fi fimbria of the hippocampus
h1 thalamic fascicle
IGP internal globus pallidus
IGr indusium griseum
iml internal medullary lamina of the thalamus
IPF interpeduncular fossa
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lml lateral medullary lamina of globus pallidus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocell. p.
MDPC mediodorsal thalamic n., parvicellular p.
mls medial longitudinal stria
mml medial medullary lamina of globus pallidus
mtg mammillo-tegmental tract
opt optic tract
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
sH Heschl sulcus
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
Un uncus
us uncal sulcus
VAb basal ventroanterior n.
VCl ventral claustrum
VGP ventral globus pallidus
VLb basal (inferior) ventrolateral n. [VPI] (entry zone of the cerebellar fibers)
VLPE posterior ventrolateral n., external p.
VLPI posterior ventrolateral n., internal p.
VTA ventral tegmental area
ZID zona incerta, dorsal p.
ZIV zona incerta, ventral p.





MNI Position y = -19.14 mm
AHB Position y = 18.23 mm

Gyral Pattern

DG dentate gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA6 area frontalis agranularis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA24 area cingularis anterior ventralis
BA31 area cingularis posterior dorsalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

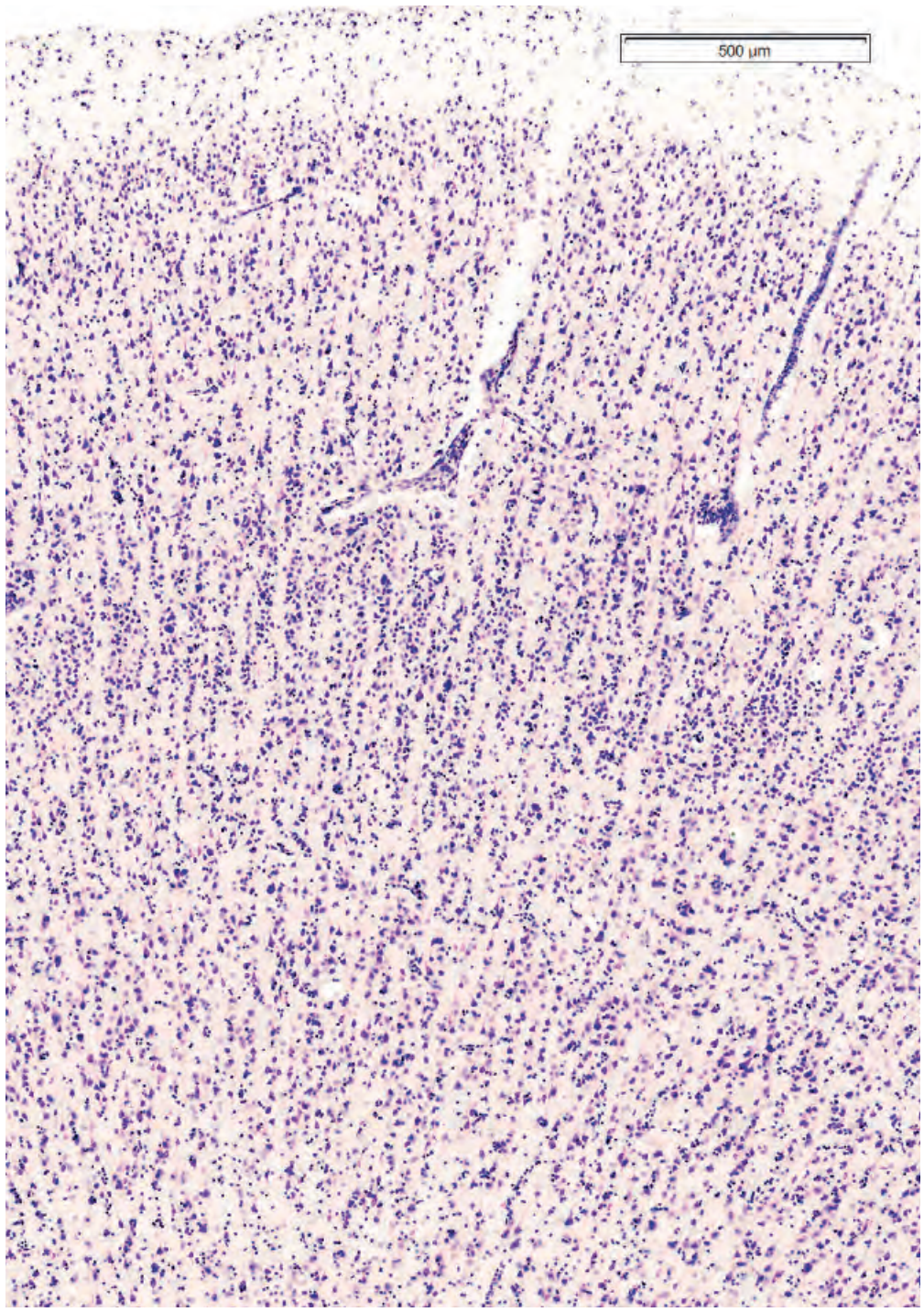
von Economo and Koskinas

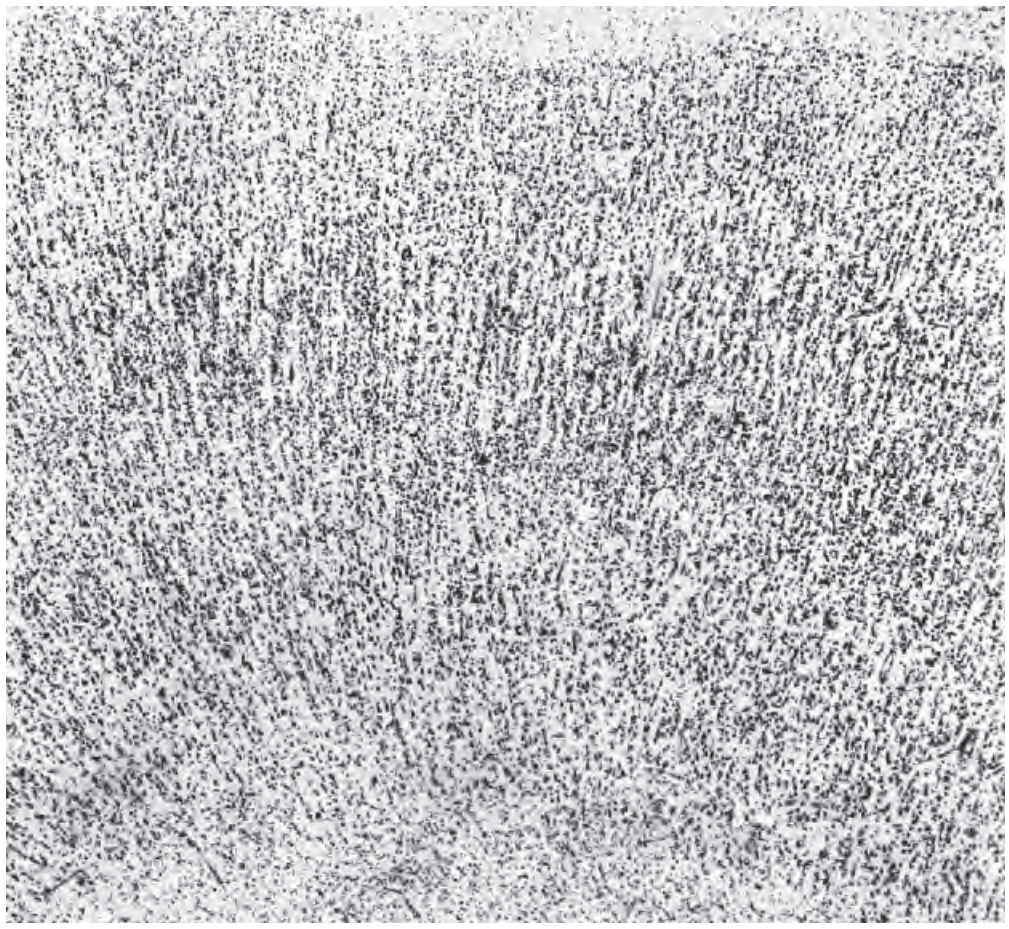
FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
24d subregion of BA 24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

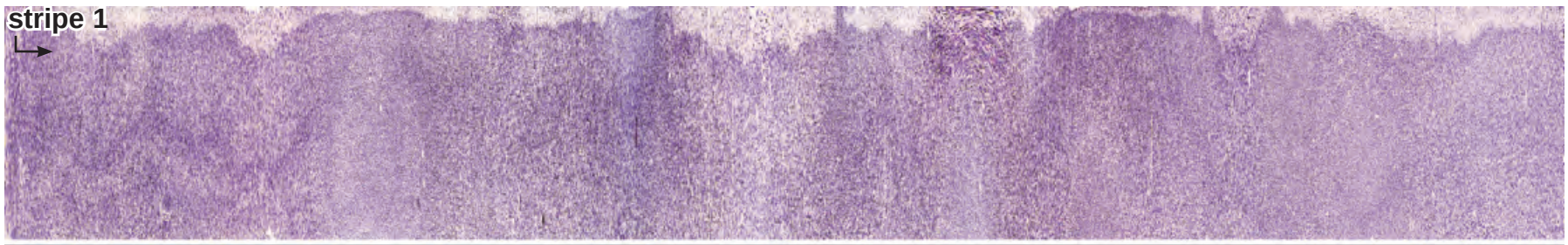
Cell stain (Nissl):
Section Nr. 47
Slice Nr. 3170

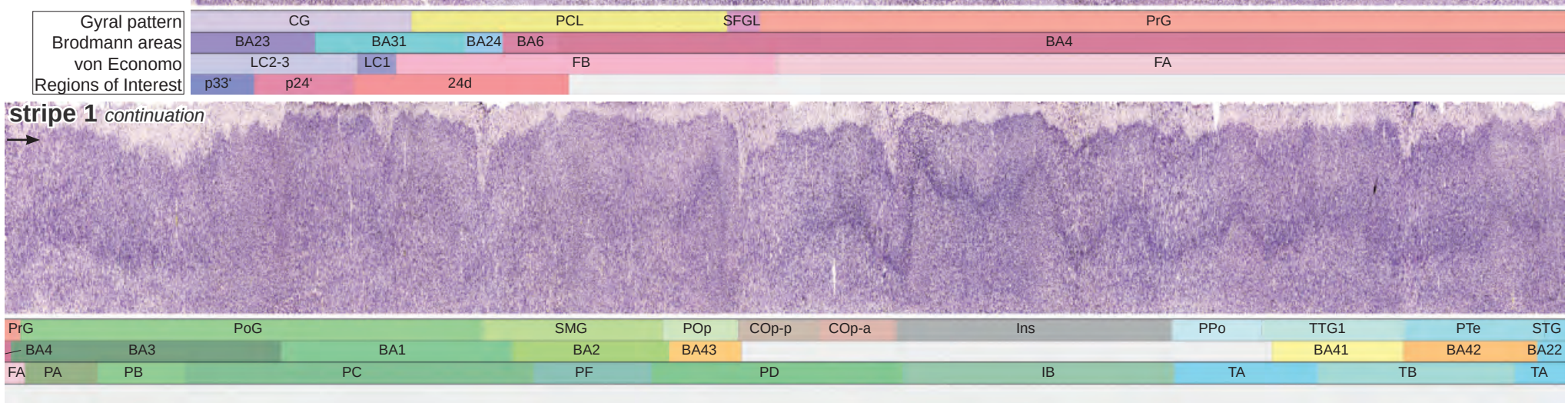


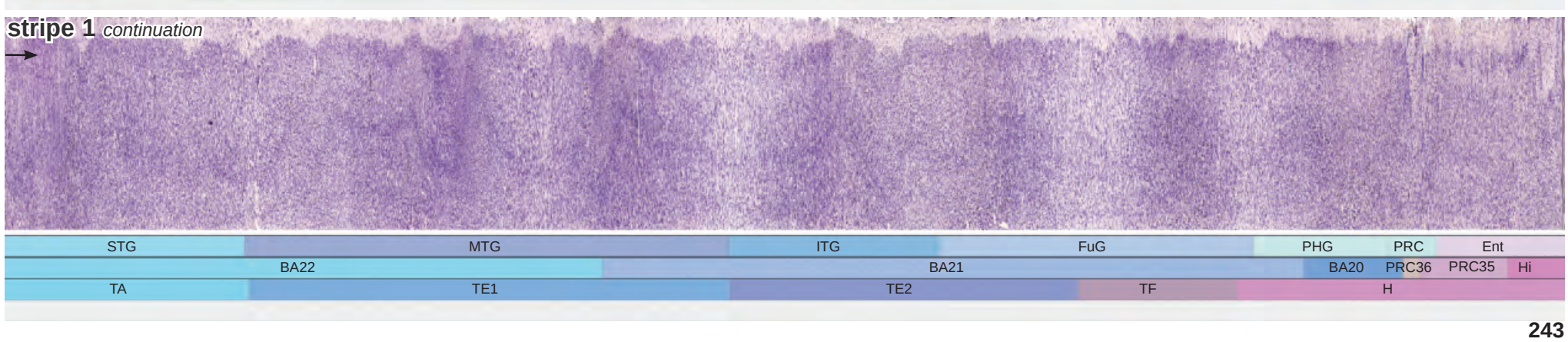


TC Area supratemporalis granulosa.

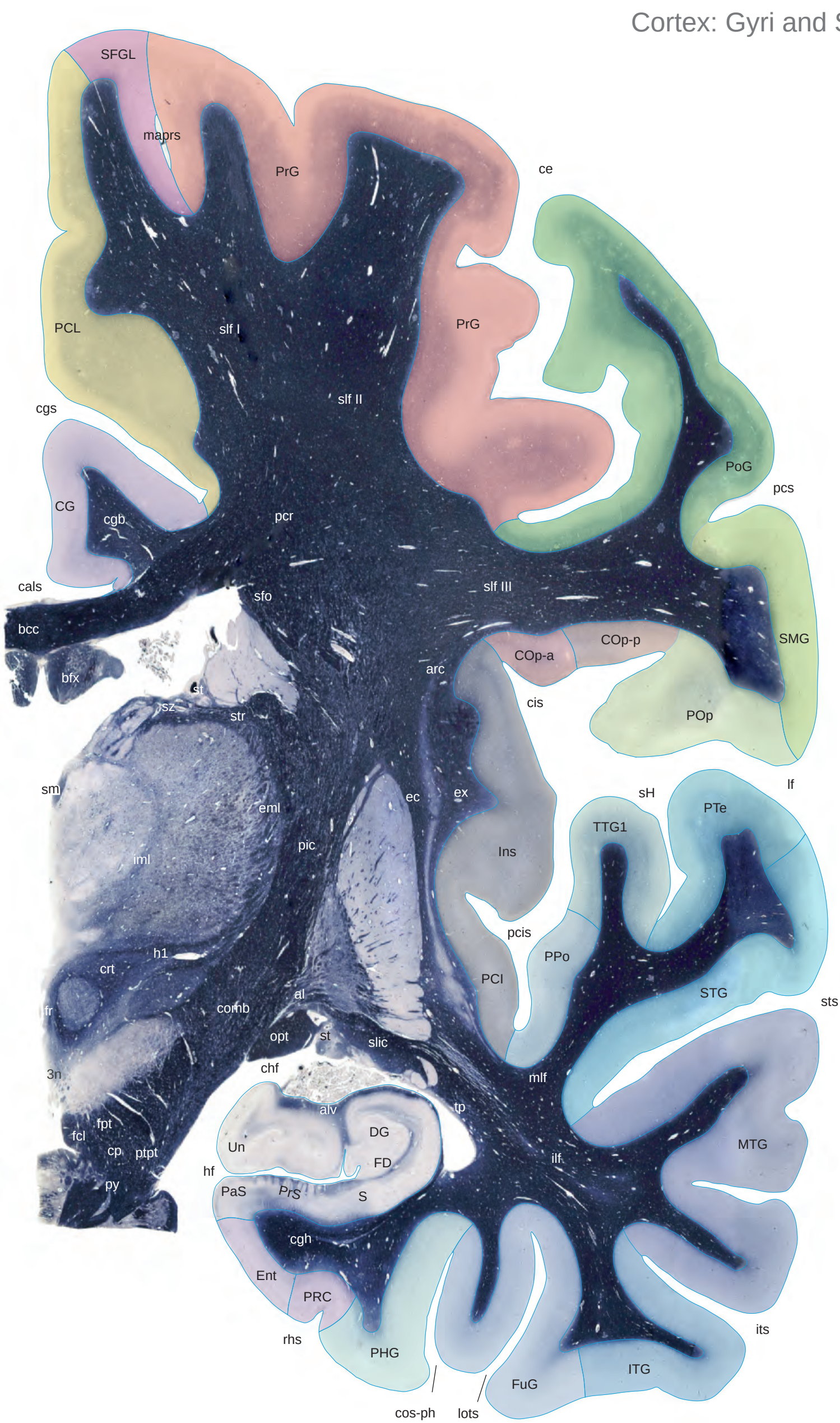
von Economo and Koskinas (1925) Plate XCIV (94)

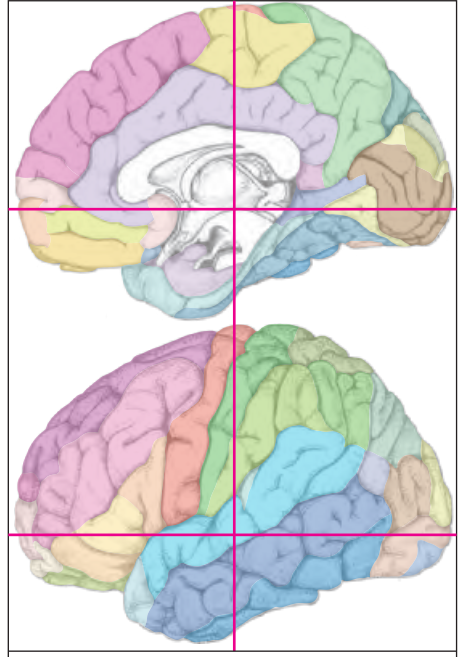






Cortex: Gyri and Sulci





MNI Position y = -19.65 mm
AHB Position y = 18.74 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PCI postcentral insular cortex
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SFGL superior frontal gyrus, lateral part
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, parahippocampal ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
maprs marginal precentral sulcus
pcis posterior central insular sulcus
pcs postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

Fibers

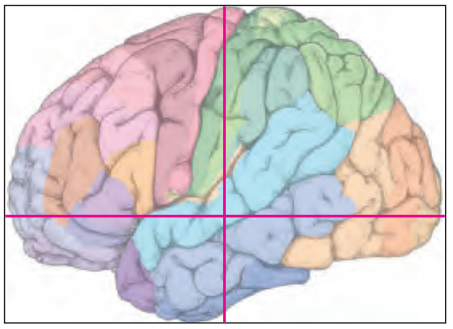
3n oculomotor nerve
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of forn*ix*
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fcl fasciculus circumligatus (Ziehen)
fpt frontopontine tract
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
mlf middle longitudinal fascicle
opt optic tract
pcr posterior corona radiata
pic posterior limb of the internal capsule
ptpt parieto-temporopontine tract
py pyramidal tract
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
str superior thalamic stria
sz stratum zonale
tp tapetum

Fiber stain (Weigert)
Section Nr. 48
Slice Nr. 3189

Cortex: Brodmann Areas

48

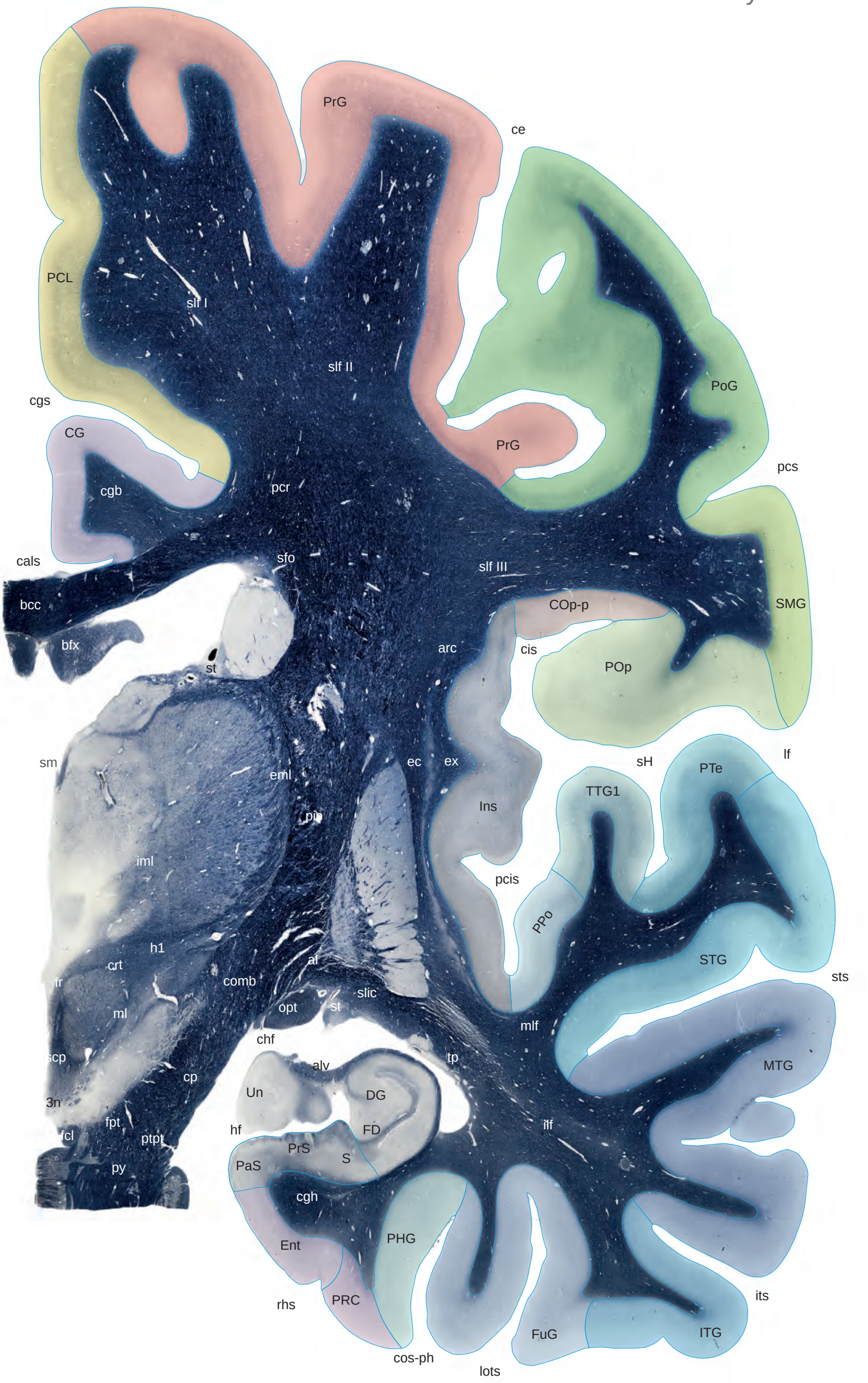
MNI: -19.65
ICL: 18.74
MCP: 4.00

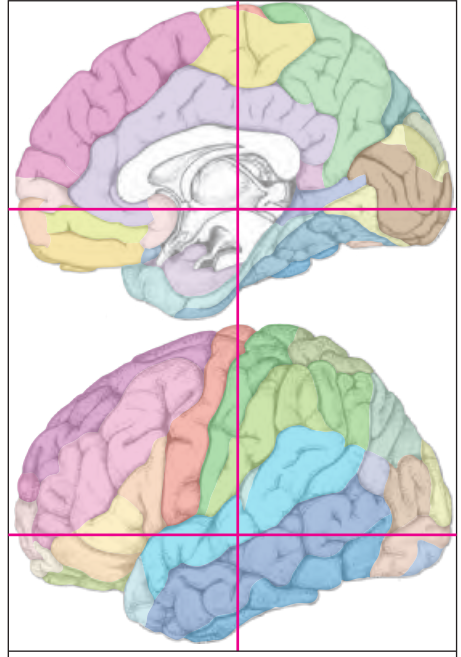


BA1-52 Brodmann areas 1-52 (see p. 101)

al ansa lenticularis
Amg amygdala
ASt amygdalostriatal transition area
AV anteroventral thalamic n.
BC basal n., compact part
bfx body of fornix
bG band of Giacomini
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
chf choroidal fissure
CM centromedian thalamic n.
comb comb system
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
cr capsule of the red n.
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DCl dorsal claustrum
DG dentate gyrus
DSF dorsal superficial n.
ec external capsule
ECL entorhinal cortex, caudal limiting subfield
EGP external globus pallidus
eml external medullary lamina of the thalamus
ex extreme capsule
FD fascia dentata
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
IGr indusium griseum
iml internal medullary lamina of the thalamus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lml lateral medullary lamina of globus pallidus
lots lateral occipitotemporal sulcus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocellular p.
MDPC mediodorsal thalamic n., parvicellular p.
opt optic tract
PaS parasubiculum
PBP parabrachial pigmented n. of the VTA
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
PN paranigral n. of ventral tegmental area
pcs postcentral sulcus
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
R red n.
Re reuniens thalamic n.
rhs rhinal sulcus
RLi rostral linear n.
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SPF subparafascicular thalamic n.
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
tfp transverse fibers of the pons
TLV temporal horn of lateral ventricle
us uncal sulcus
VCl ventral claustrum
VGP ventral globus pallidus
VLb basal (inferior) ventrolateral n.
VLPE posterior ventrolateral n., external p.
VLPI posterior ventrolateral n., internal p.
VPMPC medial ventroposterior n., parvicellular p.
VTA ventral tegmental area
ZI zona incerta

Cortex: Gyri and Sulci





MNI Position y = -21.14 mm
AHB Position y = 20.08 mm

Fiber stain (Weigert)
Section Nr. 49
Slice Nr. 3239

Gyri

DG dentate gyrus
CG cingulate gyrus
COp-p posterior central operculum
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

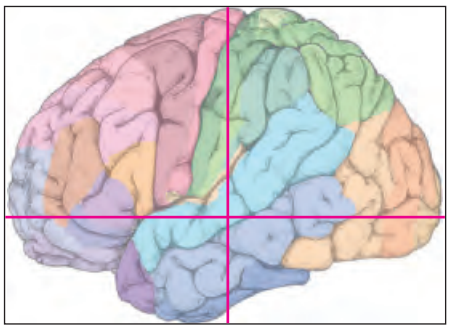
cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcis posterior central insular sulcus
pcs postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

Fibers

3n oculomotor nerve
al ansa lenticularis
alv alveus of the hippocampus
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
comb comb system
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fcl fasciculus circumligatus (Ziehen)
fpt frontopontine tract
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
opt optic tract
pcr posterior corona radiata
pic posterior limb of the internal capsule
ptpt parieto-temporopontine tract
py pyramidal tract
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum

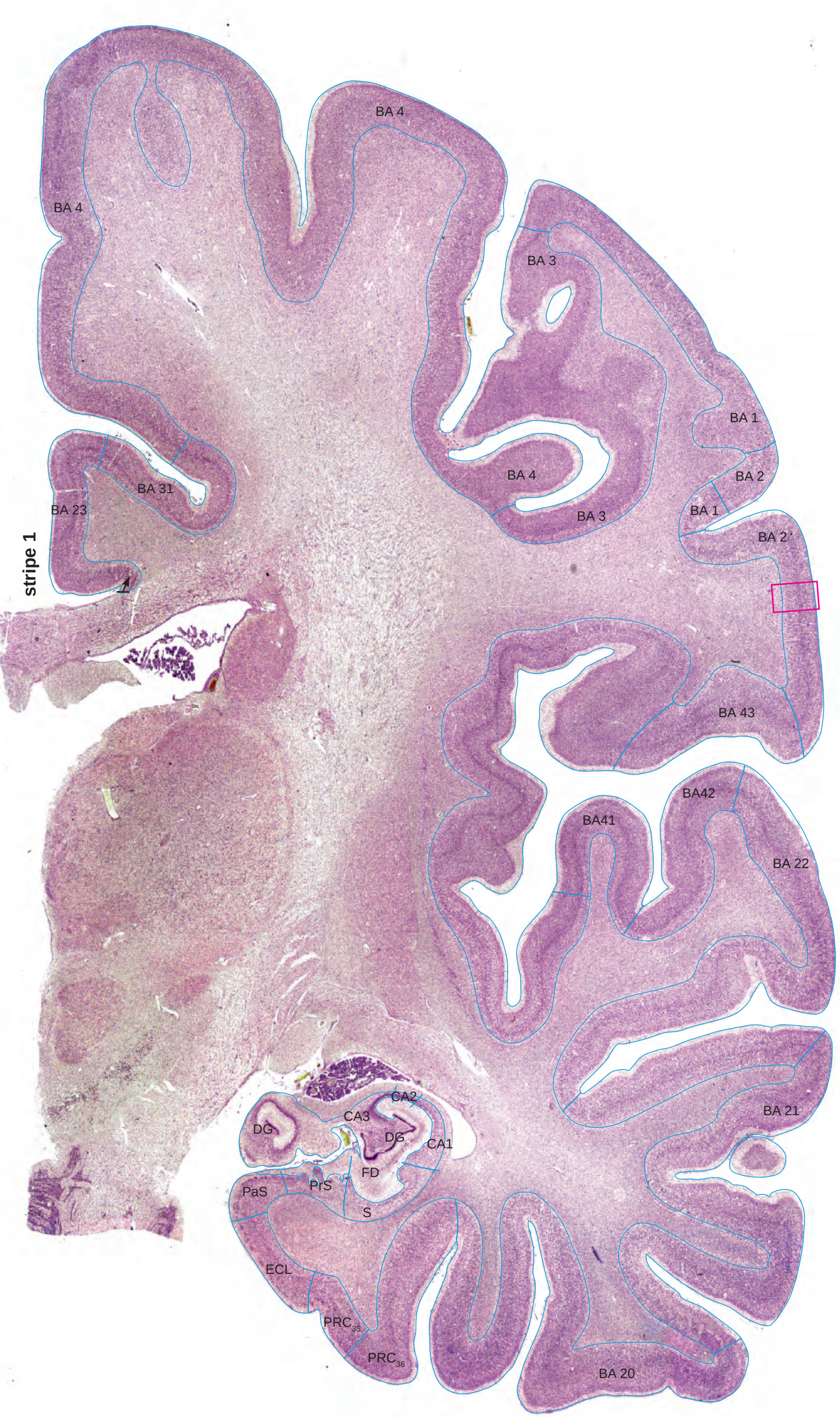
Cortex: Brodmann Areas

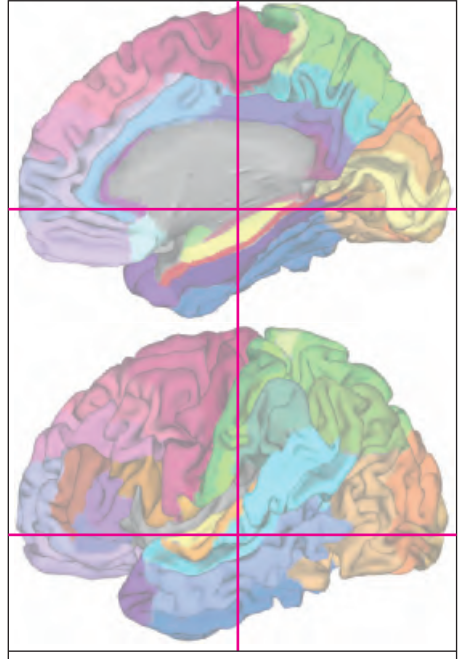
MNI: -21.14
ICL: 20.08
MCP: 5.34



BA1-52 Brodmann areas 1-52 (see p. 101)

al ansa lenticularis
alv alveus of the hippocampus
Amg amygdala
ASt amygdalostriatal transition area
bfx body of fornix
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
Cl claustrum
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
cr capsule of the red n.
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DG dentate gyrus
DSF dorsal superficial n.
ec external capsule
ECL entorhinal cortex, caudal limiting subfield
EGP external globus pallidus
eml external medullary lamina of the thalamus
ex extreme capsule
FD fascia dentata
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
IGr indusium griseum
iml internal medullary lamina of the thalamus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lml lateral medullary lamina of the globus pallidus
lots lateral occipitotemporal sulcus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocell. p.
MDPC mediodorsal thalamic n., parvicellular p.
mtg mammillo-tegmental tract
opt optic tract
PaS parasubiculum
PBP parabrachial pigmented n. of the VTA
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
PT paratenial thalamic n.
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
SB striatal cell bridge
SCS subcallosal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SPF subparafascicular thalamic n.
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
tclv tela choroidea of the lateral ventricle
tfi tenia of fimbria
TLV temporal horn of lateral ventricle
tsc tenia semicircularis
tsv thalamostriate vein
Un uncus
us uncal sulcus
VGP ventral globus pallidus
VLb basal (inferior) ventrolateral n. [VPI] (entry zone of the cerebellar fibers)
VLPE posterior ventrolateral n., external p.
VLPI posterior ventrolateral n., internal p.
VPL lateral thalamic ventroposterior n.
VPMPC medial ventroposterior n., parvicellular p.
VTA ventral tegmental area
ZI zona incerta





MNI Position y = -21.14 mm
AHB Position y = 20.13 mm

Gyral Pattern

DG dentate gyrus
CG cingulate gyrus
COp-p posterior central operculum
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PPo planum polare
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

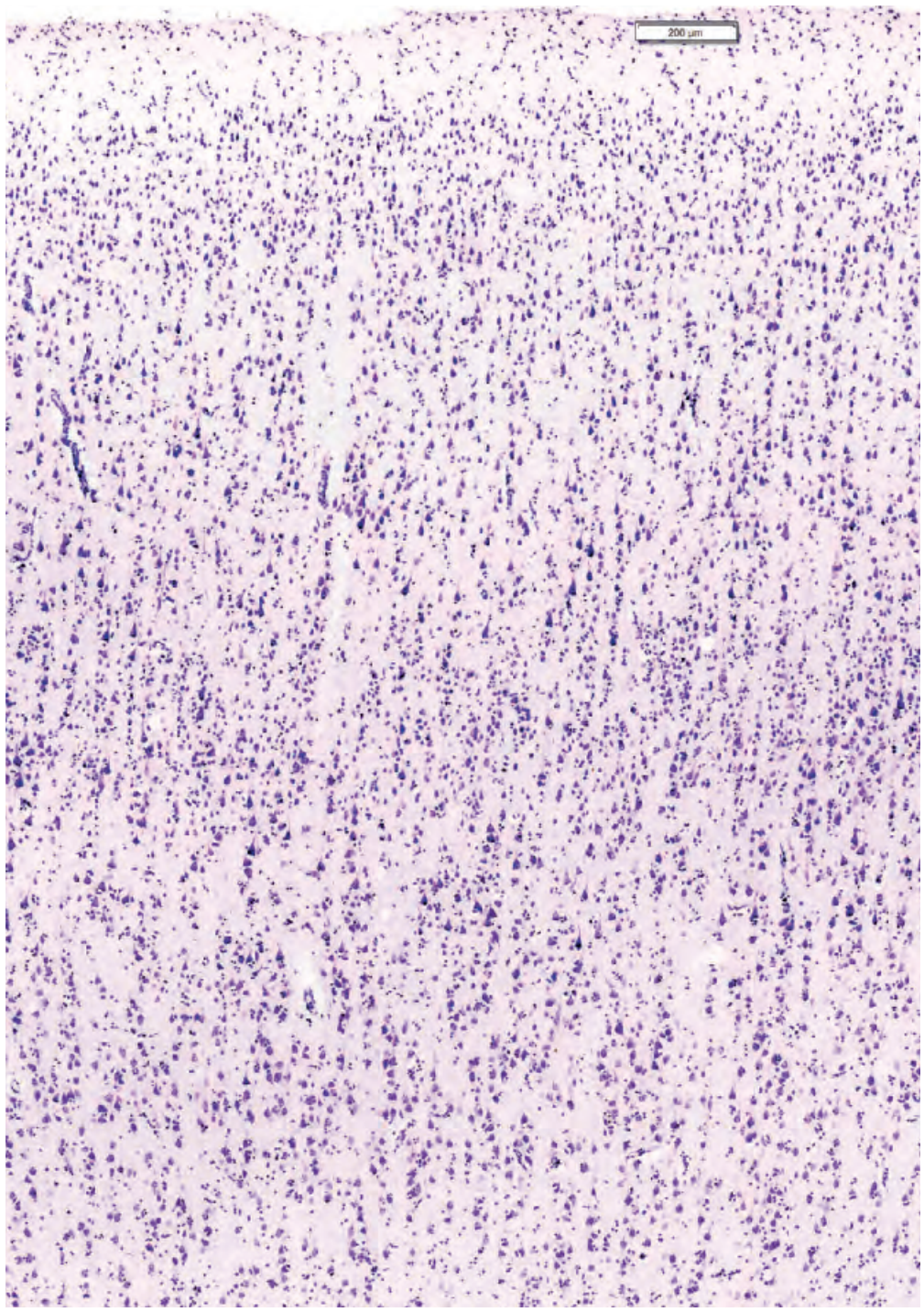
von Economo and Koskinas

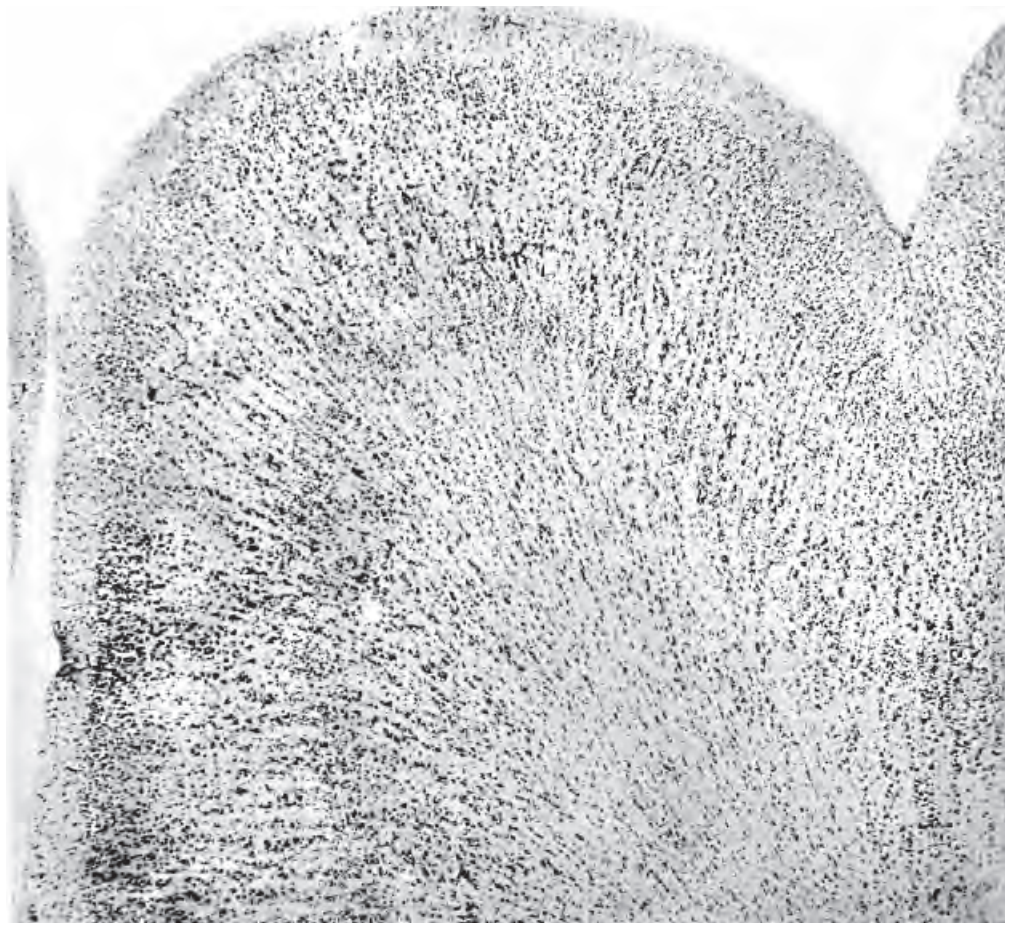
FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
24d subregion of BA 24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

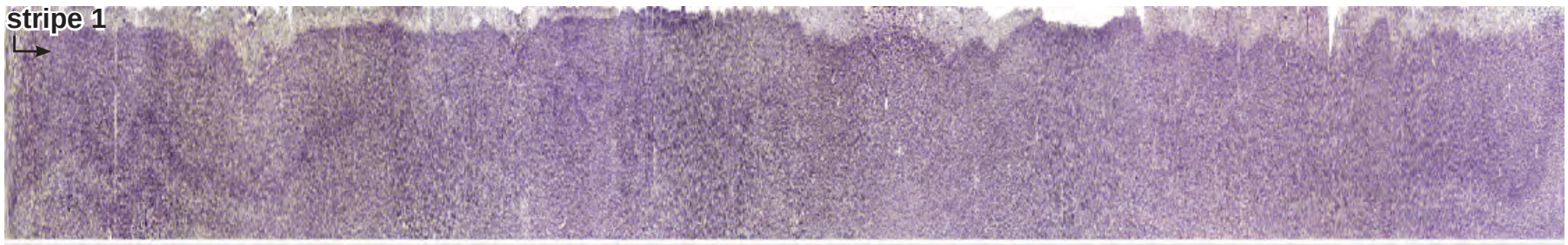
Cell stain (Nissl):
Section Nr. 49
Slice Nr. 3241



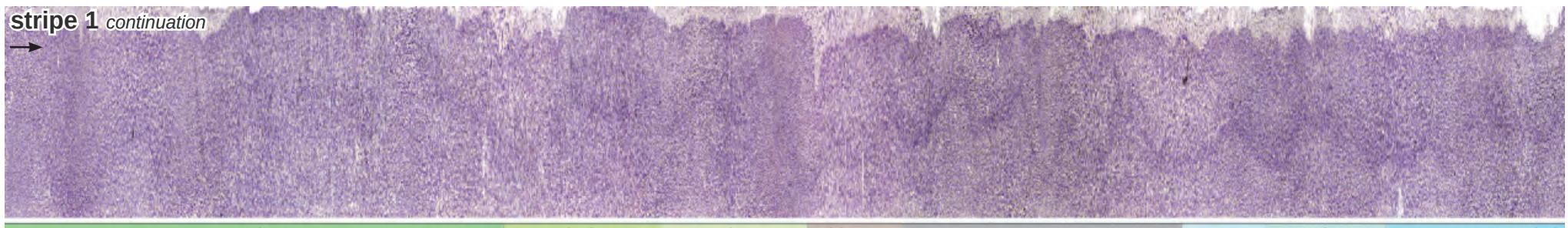


PFt(op) Area supramarginalis tenuicorticalis (in operculo).

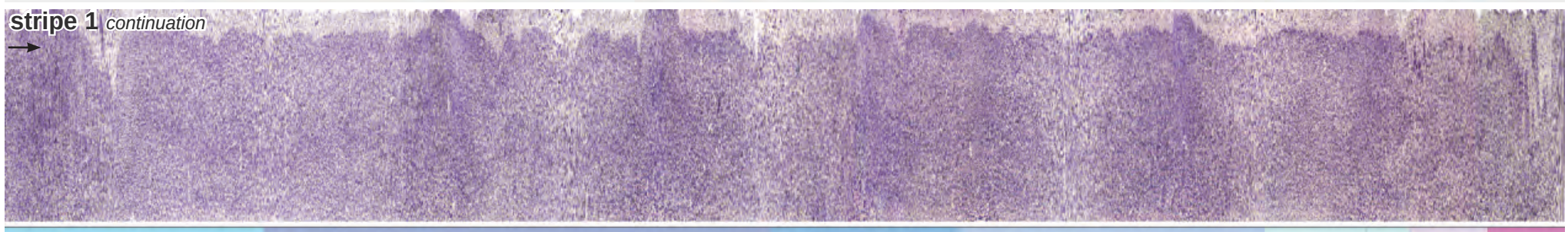
von Economo and Koskinas (1925) Plate LXXVII (77)



Gyral pattern	CG	PCL	PrG	PoG
Brodmann areas	BA23	BA31	BA4	BA3
von Economo	LC2-3	LC1	FB	FA	PA	PB
Regions of Interest	p33‘	p24‘	24d	

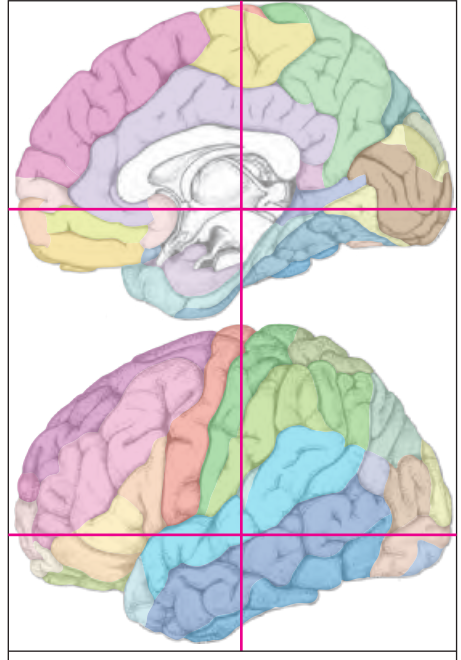


PoG			SMG	POp	COp-p	Ins	PPo	TTG1	PTe	STG
BA3	BA1	BA2	BA1	BA2	BA43			BA41	BA42	BA22
PB	PC	PF	PC	PF	PD	IB	TA	TB		TA



STG	MTG	ITG	FuG	PHG	PRC	Ent	Hi
BA22	BA21	BA20		PRC36	PRC35	Hi	
TA	TE1	TE2	TF	H			

Cortex: Gyri and Sulci



MNI Position y = -22.49 mm
AHB Position y = 21.47 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
Un uncus

Sulci

cals callosal sulcus
ce central sulcus
cgs-p cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
fds fimbriodentate sulcus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
pcs postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

Fibers

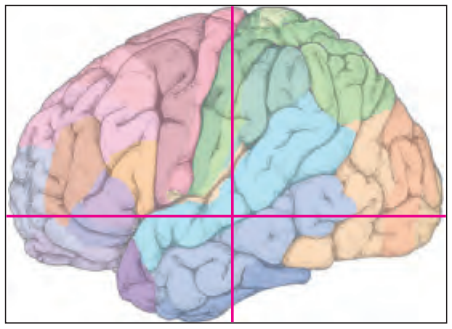
al ansa lenticularis
arc arcuate fascicle
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
ex extreme capsule
fcl fasciculus circumligatus (Ziehen)
fpt frontopontine tract
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
lls lateral longitudinal stria
ml medial lemniscus
mlf middle longitudinal fascicle
mls medial longitudinal stria
opt optic tract
pcr posterior corona radiata
pic posterior limb of the internal capsule
ptpt parieto-temporopontine tract
py pyramidal tract
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum

Fiber stain (Weigert)
Section Nr. 50
Slice Nr. 3291

Cortex: Brodmann Areas

50

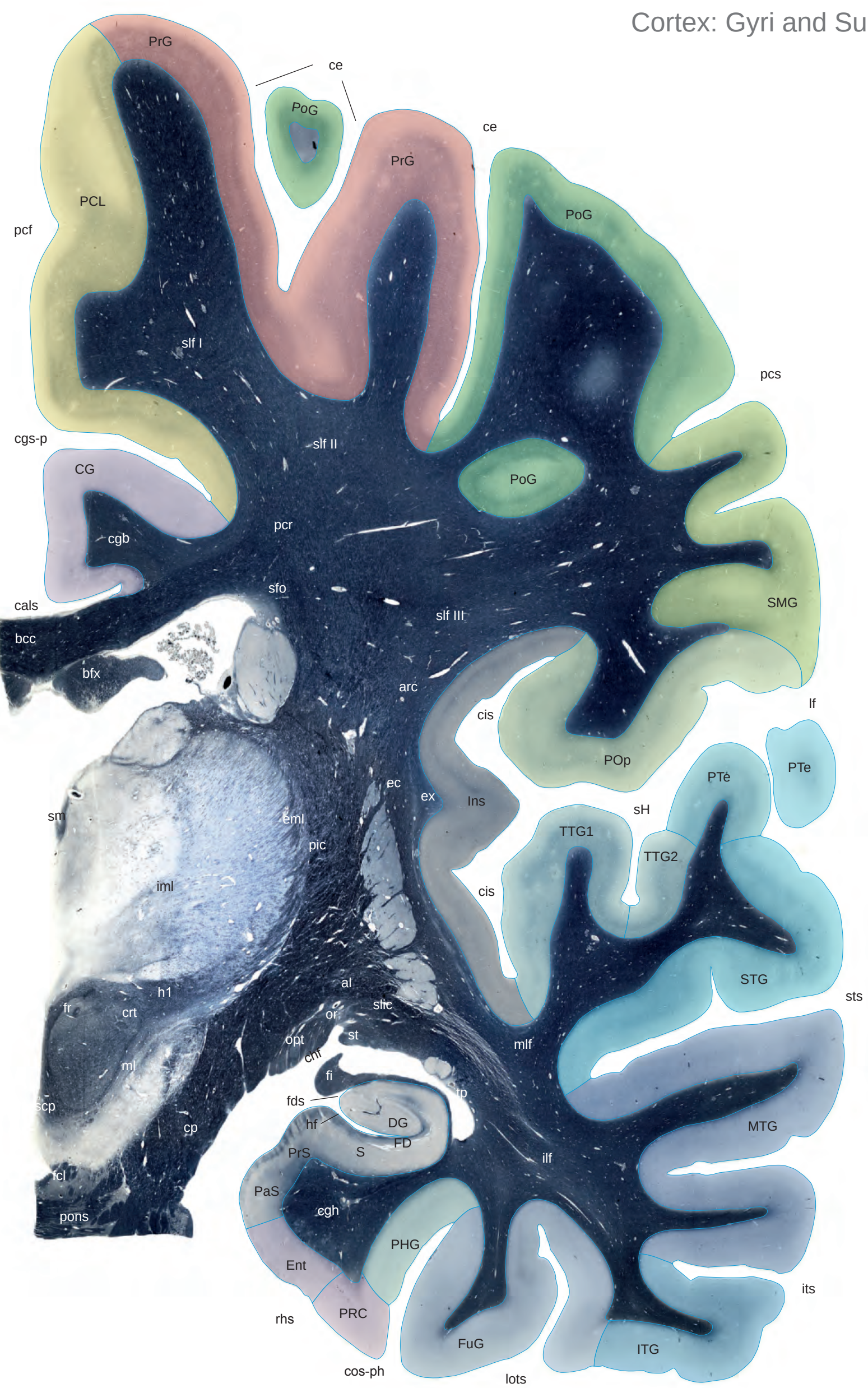
MNI: -22.49
ICL: 21.47
MCP: 6.73

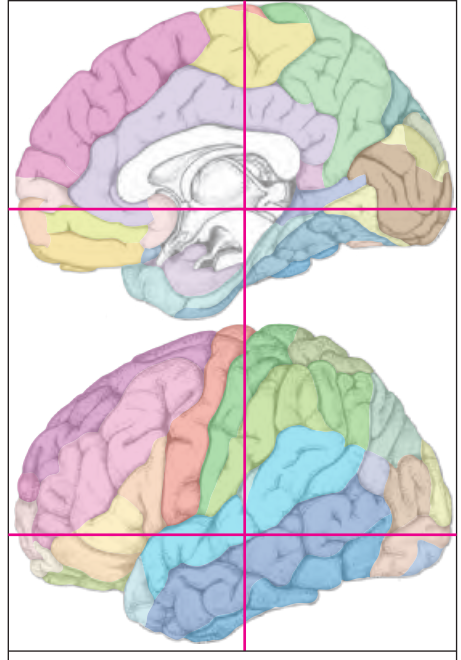


BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
al ansa lenticularis
Amg amygdala
ASt amygdalostriatal transition area
bfx body of fornix
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs-p cingulate sulcus, posterior p.
Cl claustrum
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
cr capsule of the red n.
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DG dentate gyrus
Dk nucleus of Darkschewitsch
DSF dorsal superficial n.
ec external capsule
ECL entorhinal cortex, caudal limiting subfield
EGP external globus pallidus
eml external medullary lamina of the thalamus
ex extreme capsule
FD fascia dentata
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
hf hippocampal fissure
iml internal medullary lamina of the thalamus
IP interpeduncular n.
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lml lateral medullary lamina of the globus pallidus
lots lateral occipitotemporal sulcus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocellular part
MDPC mediodorsal thalamic n., parvicellular p.
MDPL mediodorsal thalamic n., paralaminar p.
opt optic tract
PaS parasubiculum
PBP parabrachial pigmented n.
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
PT paratenial thalamic n.
Pu putamen
PuV ventral putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SPF subparafascicular thalamic n.
st stria terminalis
STh subthalamic n.
sts superior temporal sulcus
TCd tail of caudate n.
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
Un uncus
VGP ventral globus palidus
VLPE posterior ventrolateral n., external p.
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
VPL lateral thalamic ventroposterior n.
VPM medial thalamic ventroposterior n.
VPMPC medial ventroposterior n., parvicell. p.
VTA ventral tegmental area
ZI zona incerta

Cortex: Gyri and Sulci





MNI Position y = -24.35 mm
AHB Position y = 22.76 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs-p cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
fds fimbriodentate sulcus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
pcs postcentral sulcus
rhs rhinal sulcus
sH Heschl sulcus
sts superior temporal sulcus

Fibers

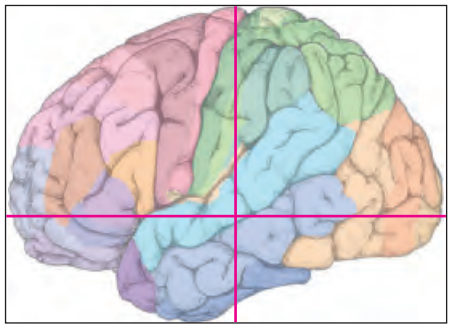
al ansa lenticularis
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fcl fasciculus circumligatus (Ziehen)
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
h1 thalamic fascicle
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
opt optic tract
or optic radiation
pcr posterior corona radiata
pic posterior limb of the internal capsule
pons pontine fibers
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum

Fiber stain (Weigert)
Section Nr. 51
Slice Nr. 3339

Cortex: Brodmann Areas

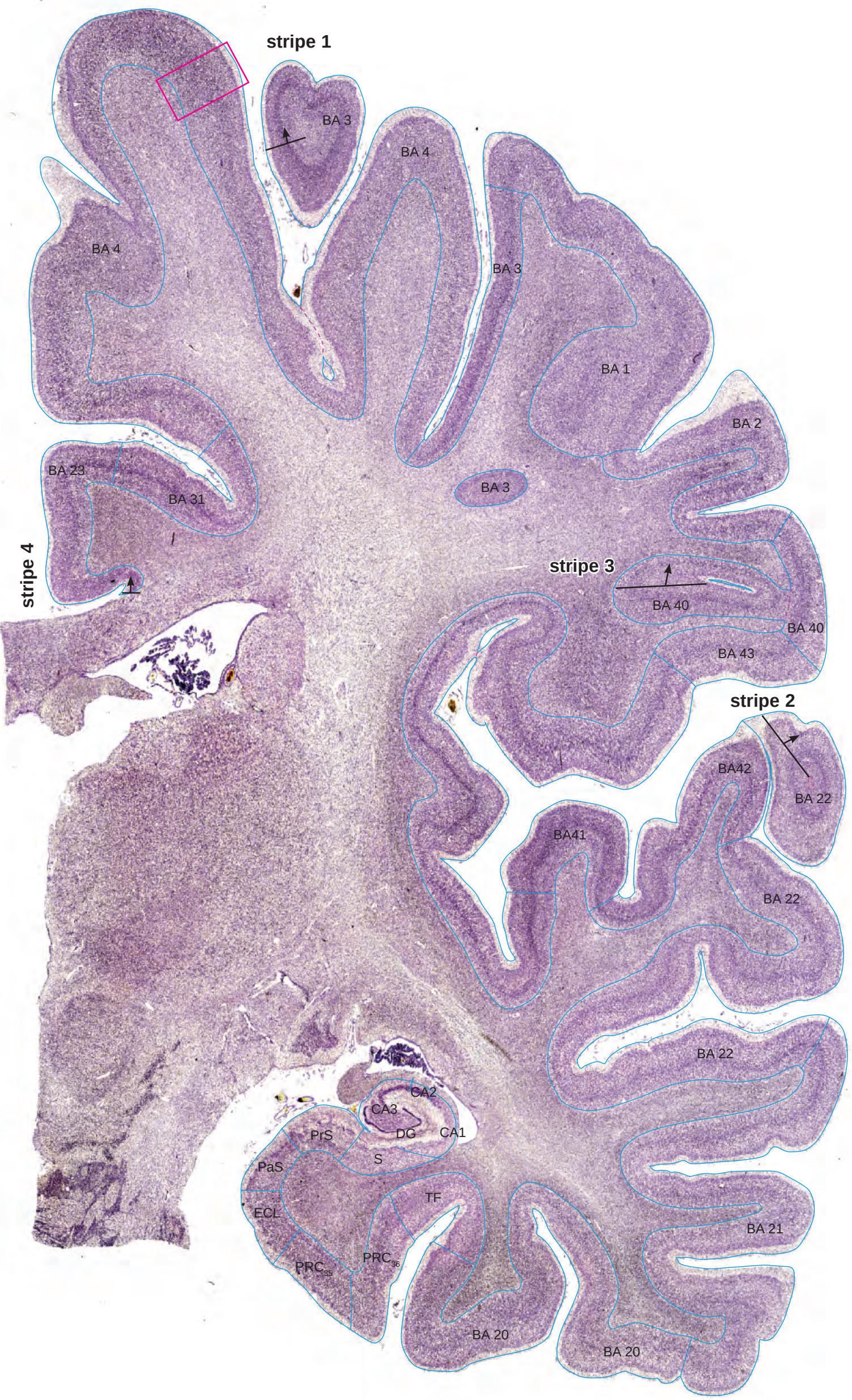
51

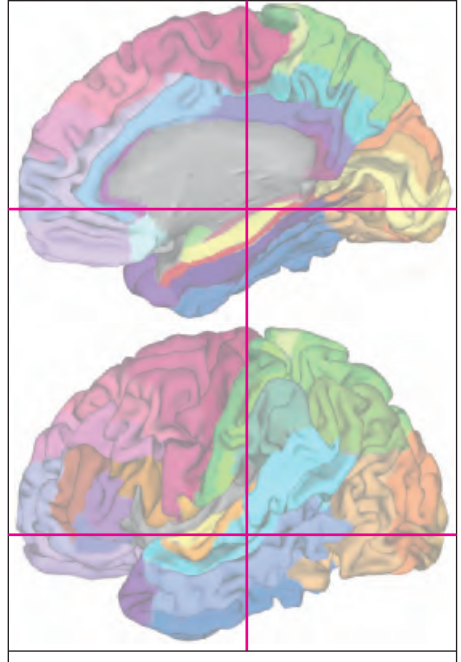
MNI: -24.35
ICL: 22.76
MCP: 8.02



BA1-52 Brodmann areas 1-52 (see p. 101)

al ansa lenticularis
bfx body of fornix
ASt amygdalostriatal transition area
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs-p cingulate sulcus, posterior p.
Cl claustrum
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal r.
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DG dentate gyrus
DSF dorsal superficial n.
ec external capsule
ECL entorhinal cortex, caudal limiting subfield
eml external medullary lamina of the thalamus
ex extreme capsule
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
hf hippocampal fissure
IF interfascicular n.
iml internal medullary lamina of the thalamus
IP interpeduncular n.
IPF interpeduncular fossa
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
lml lateral medullary lamina of the globus pallidus
lots lateral occipitotemporal sulcus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocellular p.
MDPC mediodorsal thalamic n., parvicellular p.
MDPL mediodorsal thalamic n., paralaminar p.
mtg mammillo-tegmental tract
PaS parasubiculum
PBP parabrachial pigmented n.
pcf paracentral fossa
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36
PrS presubiculum
Pu putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
rhs rhinal sulcus
RLi rostral linear n.
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
SB striatal cell bridge
scp superior cerebellar peduncle
SCS subcallosal stratum
sH Heschl sulcus
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SPF subparafascicular thalamic n.
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
tfi tenia of fimbria
tfx tenia of fornix
TLV temporal horn of lateral ventricle
tp tapetum
tsc tenia semicircularis
tt tenia of thalamus
VLPE posterior ventrolateral n., external p.
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
VPL lateral thalamic ventroposterior n.
VPM medial thalamic ventroposterior n.
VPMPC medial ventroposterior n., parvicellular p.
VTA ventral tegmental area
ZI zona incerta





MNI Position y = -24.77 mm
AHB Position y = 23.59 mm

Gyral Pattern

DG dentate gyrus
CG cingulate gyrus
Ent entorhinal cortex
FD fascia dentata
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
PRC35 perirhinal cortex, BA 35
PRC36 perirhinal cortex, BA 36

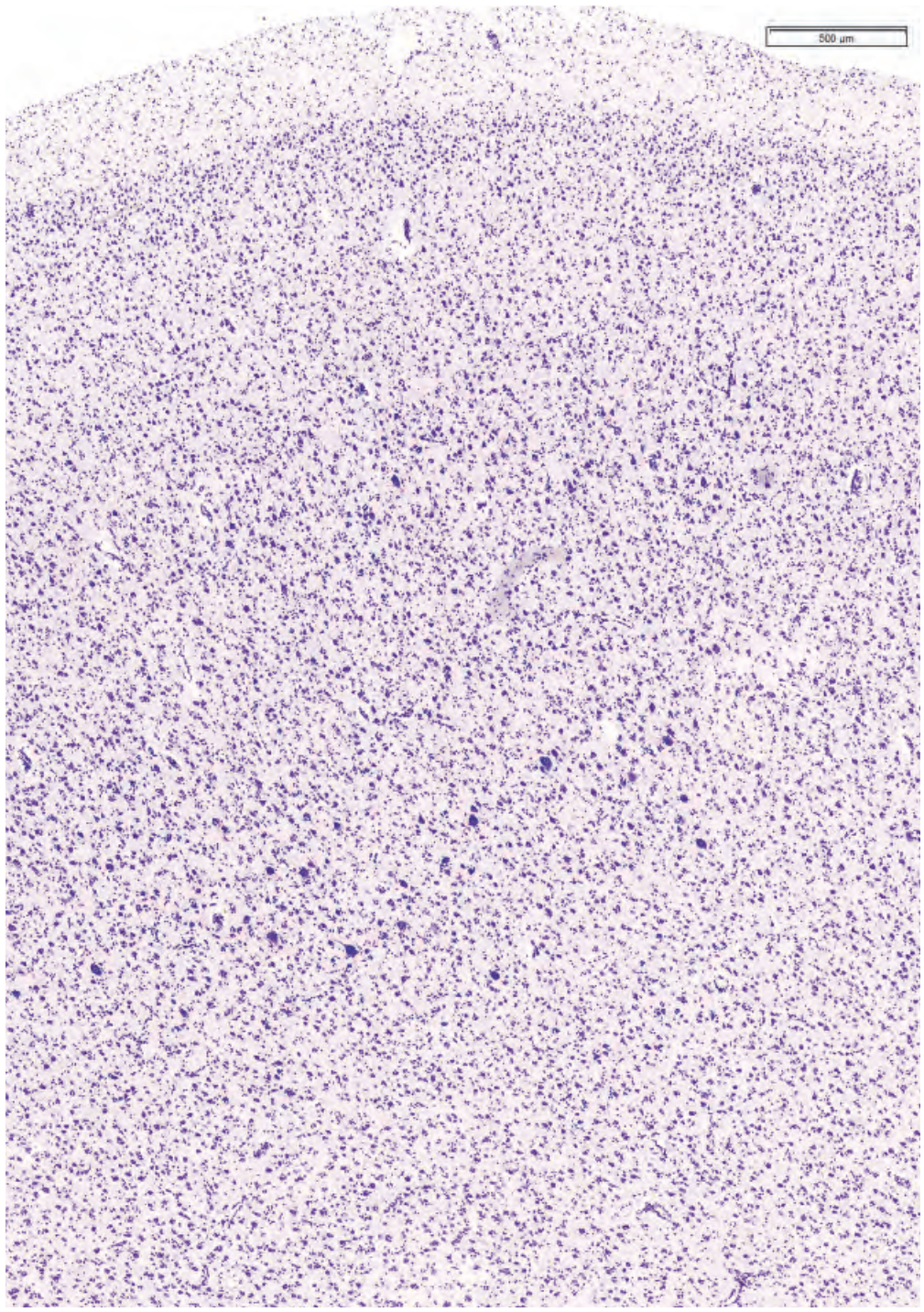
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

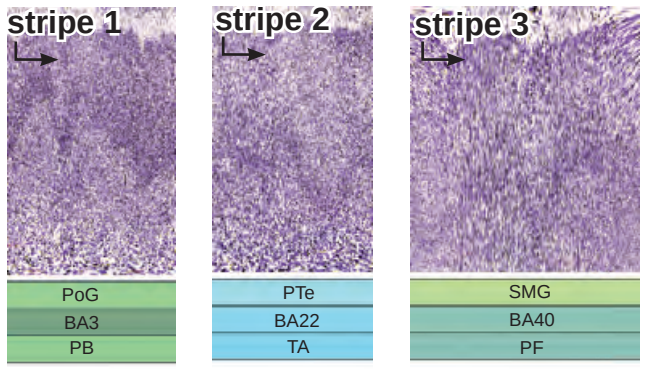
B. Vogt:
24d subregion of BA 24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

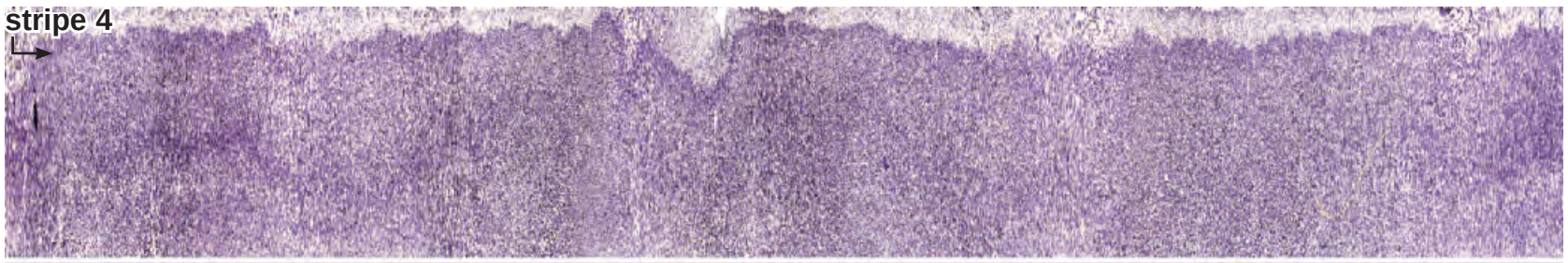
Cell stain (Nissl):
Section Nr. 51
Slice Nr. 3370



FAgamma Area praecentralis gigantopyramidalis.

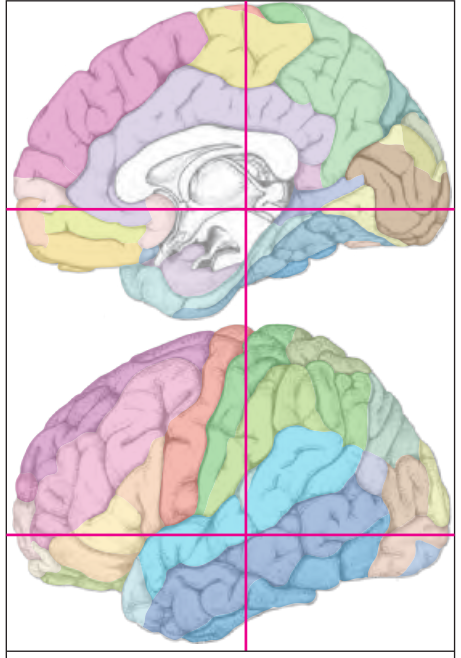
von Economo and Koskinas (1925) Plate II (2)





| | | |

Cortex: Gyri and Sulci



MNI Position y = -25.31 mm
AHB Position y = 24.01 mm

Gyri

DG dentate gyrus
CG cingulate gyrus
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PRC perirhinal cortex
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
pcs postcentral sulcus
sH Heschl sulcus
sts superior temporal sulcus
tvt transverse temporal sulcus

Fibers

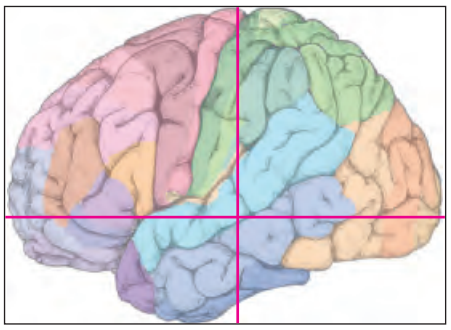
3n oculomotor nerve
al ansa lenticularis
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
ec external capsule
eml external medullary lamina of the thalamus
ex extreme capsule
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
or optic radiation
pcr posterior corona radiata
pic posterior limb of the internal capsule
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum
vtx ventral tegmental decussation

Fiber stain (Weigert)
Section Nr. 52
Slice Nr. 3386

Cortex: Brodmann Areas

52

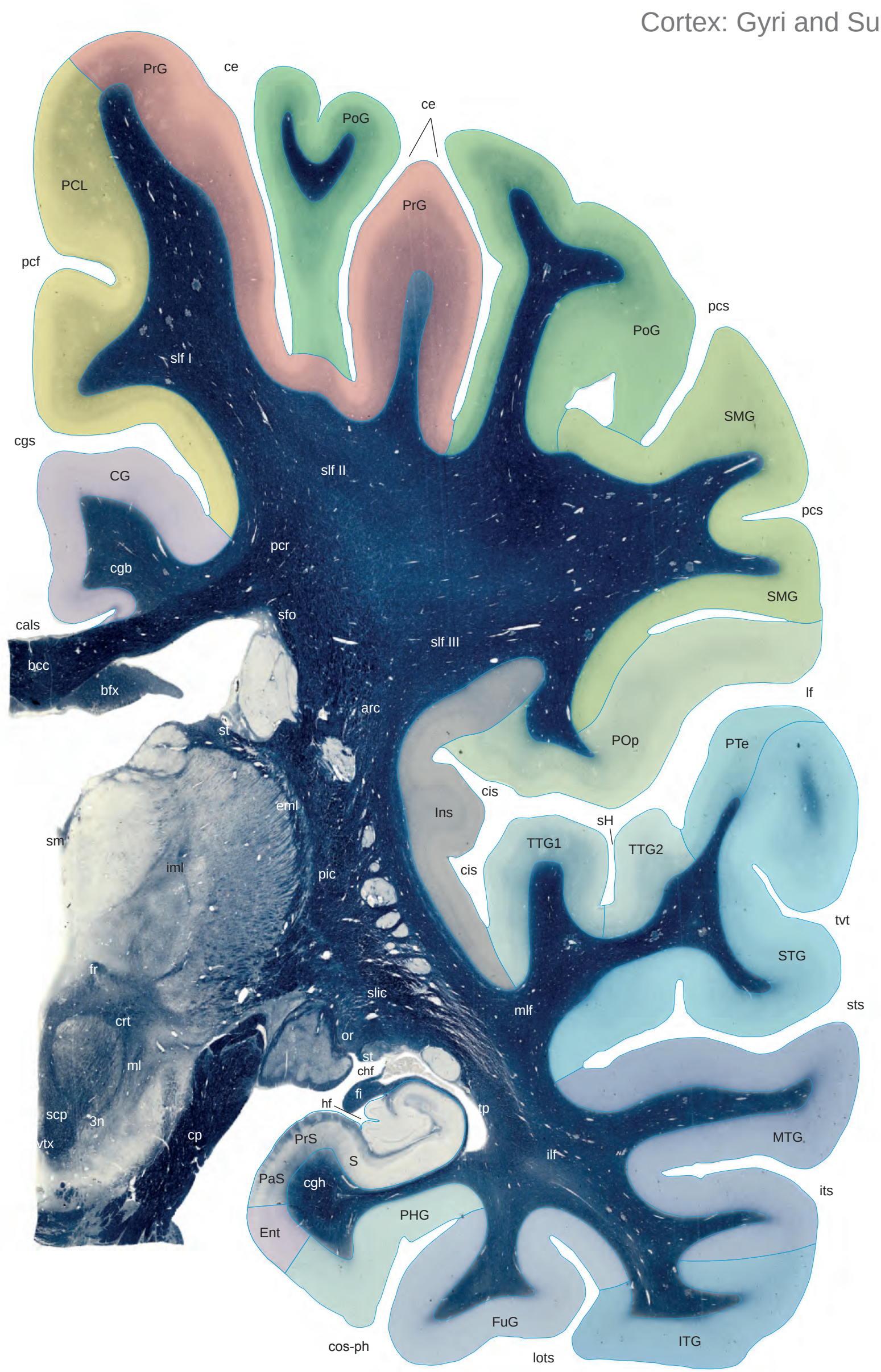
MNI: -25.31
ICL: 24.01
MCP: 9.27

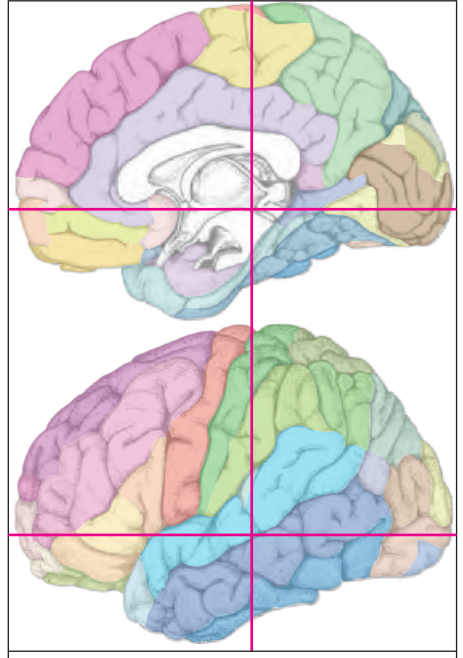


BA1-52 Brodmann areas 1-52 (see p. 101)

ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus)
APul anterior (oral) pulvinar nucleus
ASt amygdalostriatal transition area
bfx body of fornix
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs-p cingulate sulcus, posterior p.
Cl claustrum
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DG dentate gyrus
DSF dorsal superficial n.
ec external capsule
eml external medullary lamina of the thalamus
EW Edinger-Westphal n.
ex extreme capsule
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
hf hippocampal fissure
IF interfascicular n.
IGr indusium griseum
iml internal medullary lamina of the thalamus
IP interpeduncular n.
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
lots lateral occipitotemporal sulcus
LV lateral ventricle
MDMC mediodorsal thalamic n., magnocellular part
MDPC mediodorsal thalamic n., parvicellular p.
MDPL mediodorsal thalamic n., paralaminar p.
mtg mammillo-tegmental tract
PaS parasubiculum
PBP parabrachial pigmented n.
pcf paracentral fossa
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PrS presubiculum
PPA peripeduncular area
PT paratenial thalamic n.
Pu putamen
PV paraventricular thalamic n.
Re reuniens thalamic n.
RLi rostral linear n.
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
scp superior cerebellar peduncle
SCS subcallosal stratum
SGe supragreniculate n.
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SPF subparafascicular thalamic n.
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
tvt transverse temporal sulcus
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
VPL lateral thalamic ventroposterior n.
VPM medial thalamic ventroposterior n.
VPMPC medial ventroposterior n., parvicellular part
VTA ventral tegmental area
ZI zona incerta

Cortex: Gyri and Sulci





MNI Position y = -26.74 mm
AHB Position y = 25.49 mm

Gyri

CG cingulate gyrus
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
pcs postcentral sulcus
sH Heschl sulcus
sts superior temporal sulcus
tvt transverse temporal sulcus

Fibers

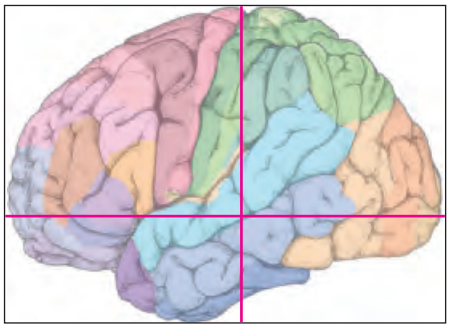
3n oculomotor nerve
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
or optic radiation
pcr posterior corona radiata
pic posterior limb of the internal capsule
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum
vtx ventral tegmental decussation

Fiber stain (Weigert)
Section Nr. 53
Slice Nr. 3441

Cortex: Brodmann Areas

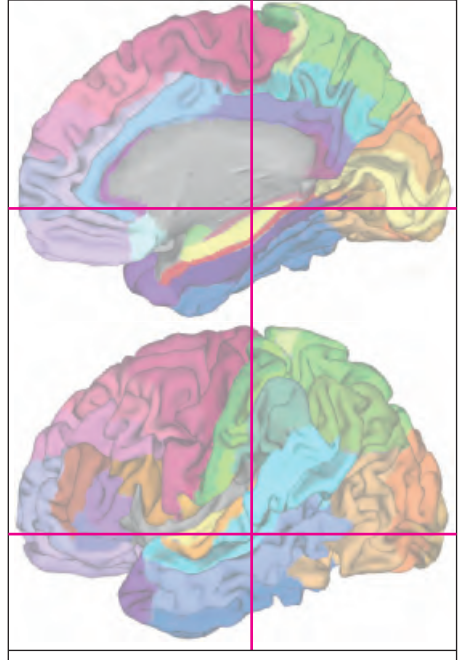
53

MNI: -26.74
ICL: 25.49
MCP: 10.75



BA1-52 Brodmann areas 1-52 (see p. 101)

ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus)
alv alveus of the hippocampus
APul anterior (oral) pulvinar nucleus
AV anteroventral nucleus (anteroprincipal nucleus)
bfx body of fornix
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cals callosal sulcus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DG dentate gyrus
DSF dorsal superficial n.
eml external medullary lamina of the thalamus
EW Edinger-Westphal n.
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-inter-peduncularis)
hf hippocampal fissure
IF interfascicular n.
iml internal medullary lamina of the thalamus
IP interpeduncular n.
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
MD medial dorsal thalamic n.
MDMC mediodorsal thalamic n., magnocellular part
MDPL mediodorsal thalamic n., paralaminar p.
ml medial lemniscus
mtg mammillo-tegmental tract
PaS parasubiculum
PBP parabrachial pigmented n.
pcf paracentral fossa
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
pcs postcentral sulcus
Pons pons
PP peripeduncular n.
PPA peripeduncular area
PrG precentral gyrus
PrS presubiculum
Pu putamen
PV paraventricular thalamic n.
RLi rostral linear n.
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
scp superior cerebellar peduncle
SCS subcallosal stratum
sfms superficial medullary stratum
sH Heschl sulcus
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tvt transverse temporal sulcus
VPb basal ventroposterior n.
VPL lateral thalamic ventroposterior n.
VPM medial thalamic ventroposterior n.
VPMPC medial ventroposterior n., parvicellular part
VTA ventral tegmental area
ZI zona incerta



MNI Position y = -26.74 mm
AHB Position y = 25.46 mm

Gyral Pattern

CG cingulate gyrus
Ent entorhinal cortex
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
BA43 area subcentralis
Hi hippocampus
TF fusiform area
TH hippocampotemporal area

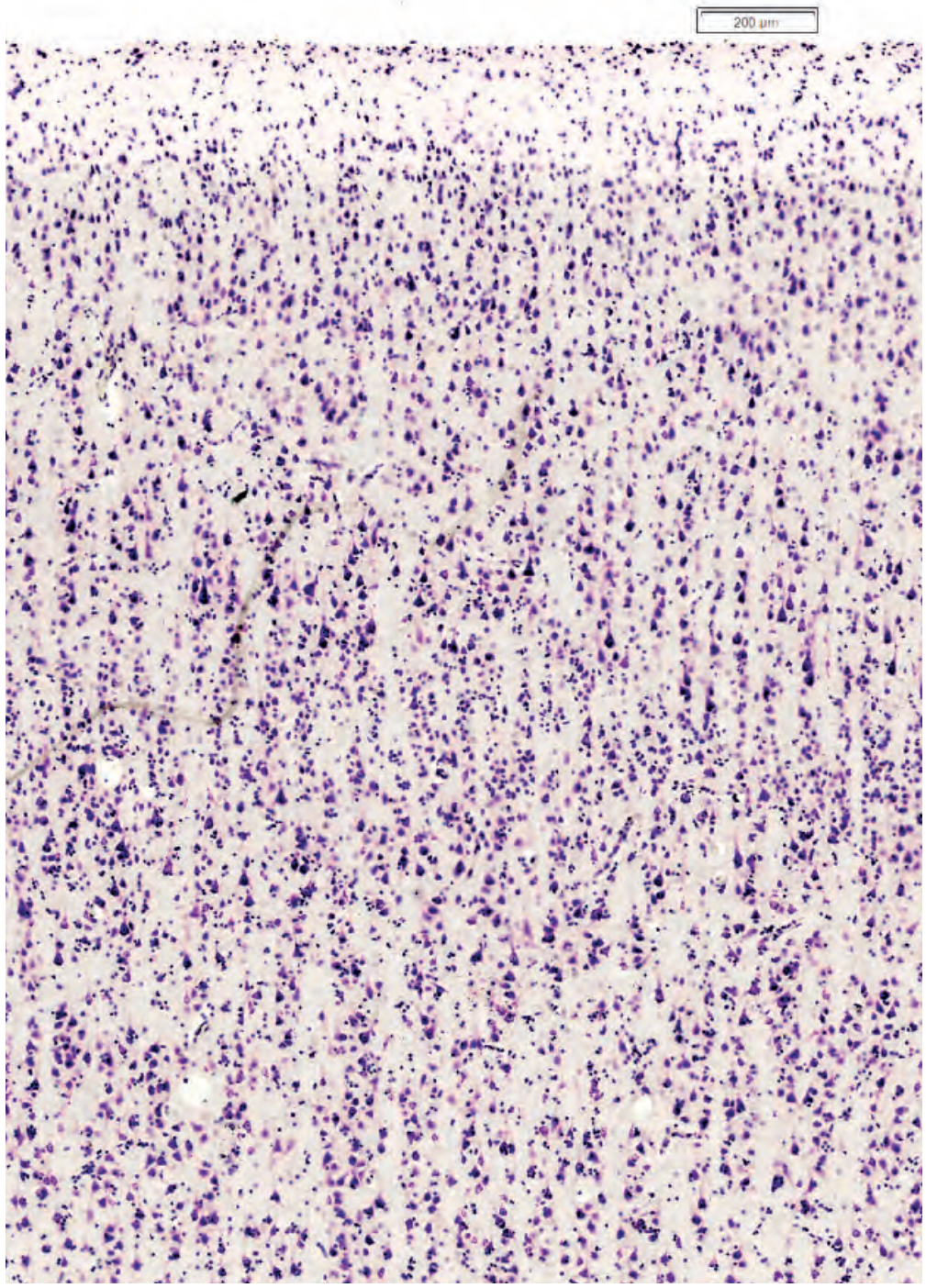
von Economo and Koskinas

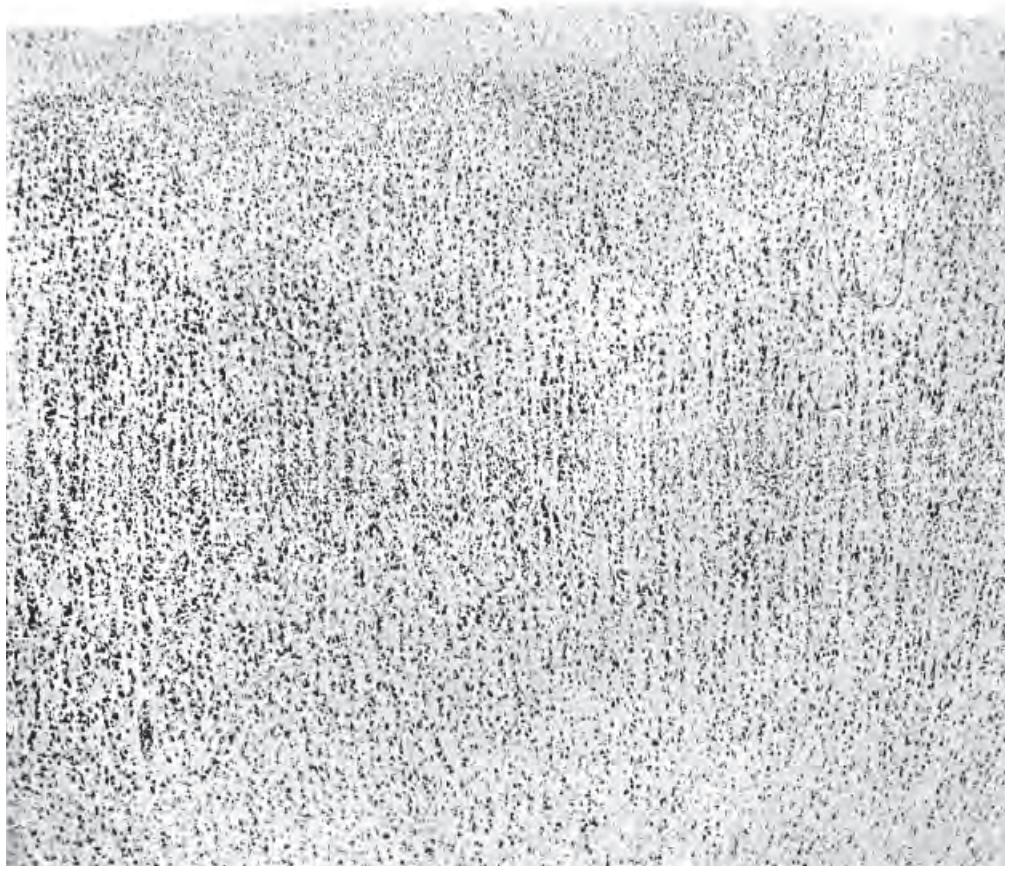
FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
24d subregion of BA 24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

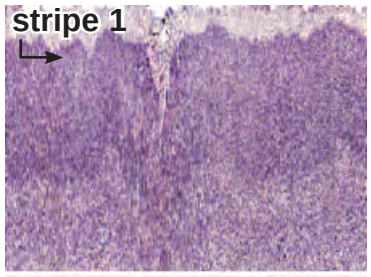
Cell stain (Nissl):
Section Nr. 53
Slice Nr. 3440



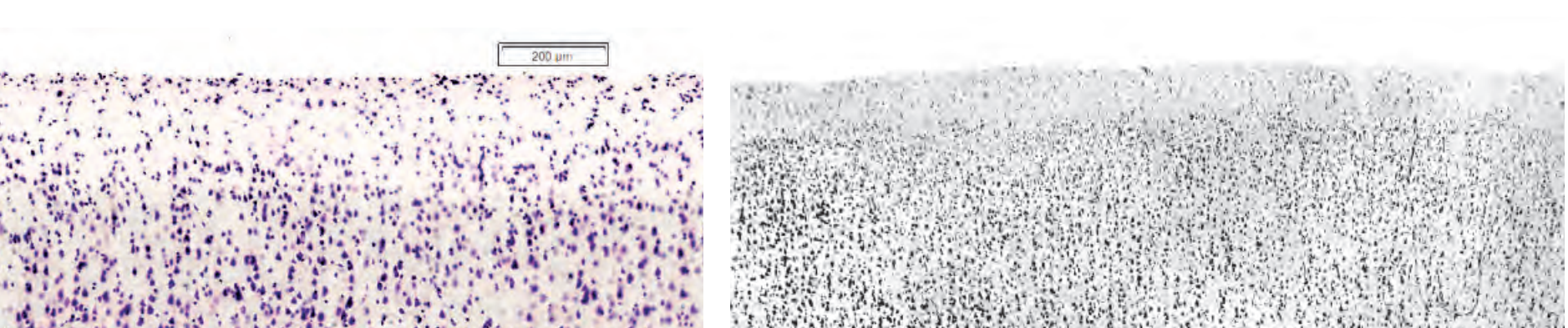


PF Area supramarginalis.

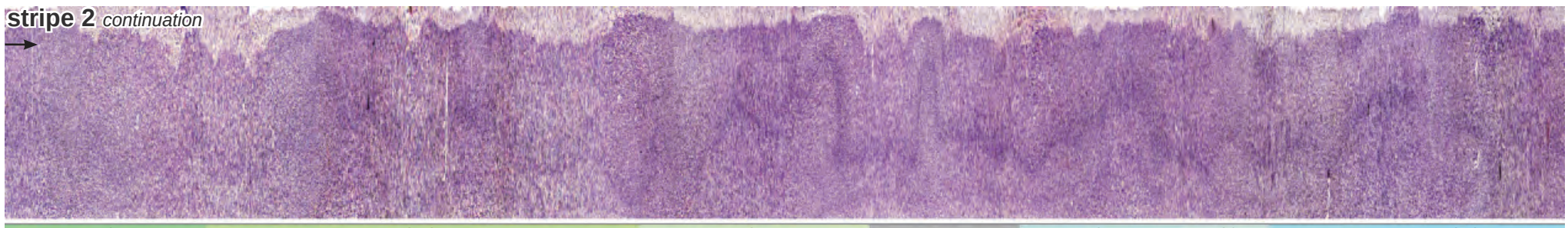
von Economo and Koskinas (1925) Plate LXXII (72)



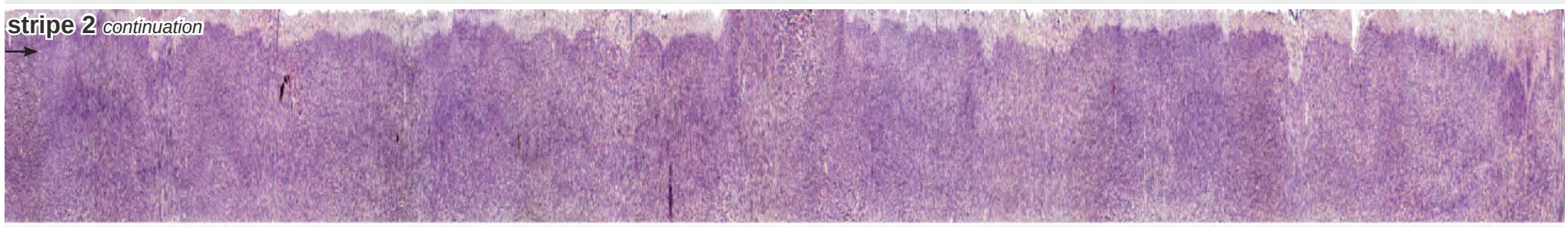
Gyral pattern	PoG		
Brodmann areas	BA3	BA1	BA3
von Economo	PB	PC	PB
Regions of Interest			



CG	PCL	PrG	PoG	PrG	PoG
BA23	BA31	BA4			BA3 / BA1
LC2-3	LC1	FB	FA	PA / FA	PA / PB / PC
p33‘	p24‘	24d			

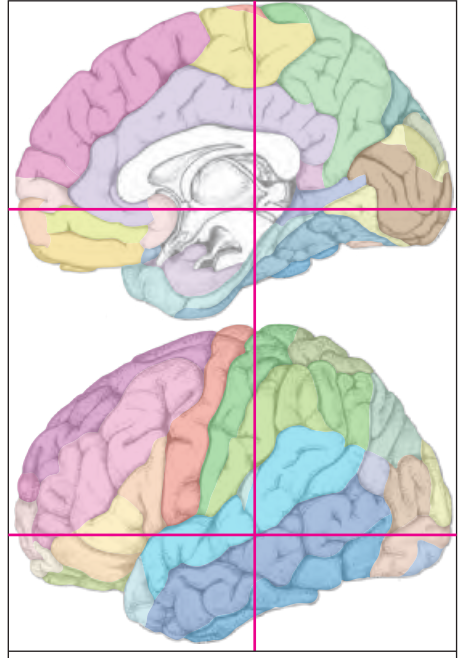


PoG	SMG	POp	Ins	TTG1	TTG2	PTe	STG	
BA1	BA2	BA40	BA43	BA41	BA42	BA22		
PC	PF	TD	PD	IB	TA	TB	TA	



STG	MTG	ITG	FuG	PHG	Ent	Hi	
BA22	BA21	BA20		TF	TH	Hi	
TA	TE1	TE2	TF	H			

Cortex: Gyri and Sulci



MNI Position y = -28.01 mm
AHB Position y = 26.64 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
S subiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
pcs postcentral sulcus
sH Heschl sulcus
sts superior temporal sulcus
tvt transverse temporal sulcus

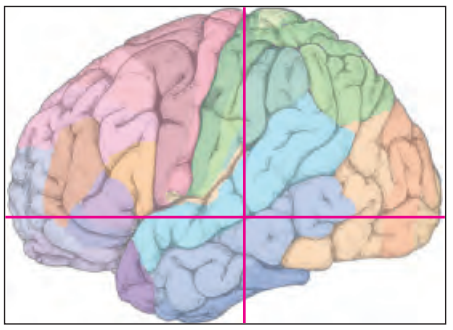
Fibers

3n oculomotor nerve
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
dtx dorsal tegmental decussation
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
lls lateral longitudinal stria
ml medial lemniscus
mlf middle longitudinal fascicle
mls medial longitudinal stria
or optic radiation
pcr posterior corona radiata
pic posterior limb of the internal capsule
scp superior cerebellar peduncle
scs subcallosal fascicle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sm stria medullaris of thalamus
st stria terminalis
tp tapetum
xscp decussation of the superior cerebellar peduncles

Fiber stain (Weigert)
Section Nr. 54
Slice Nr. 3484

Cortex: Brodmann Areas

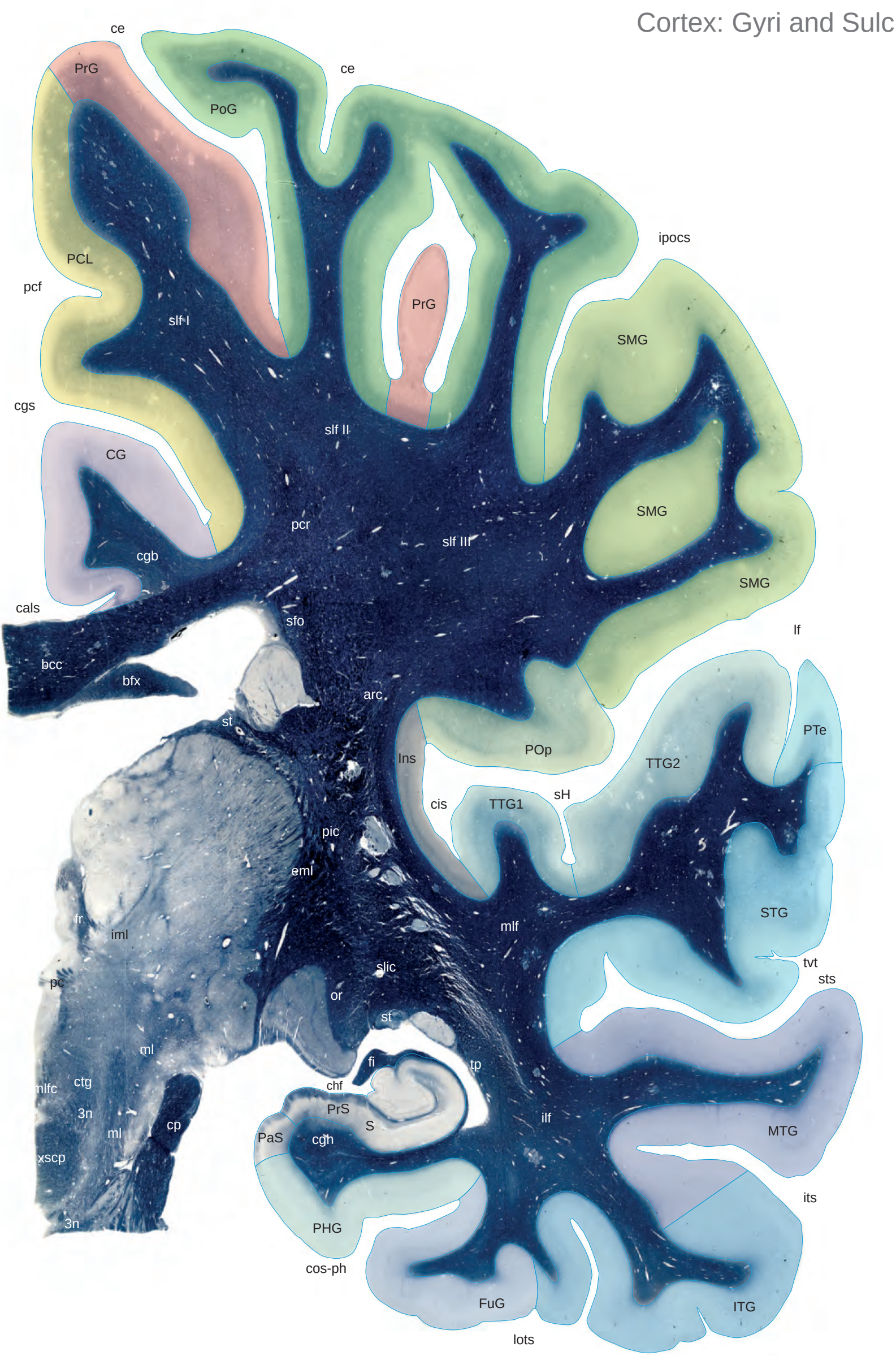
MNI: -28.01
ICL: 26.64
MCP: 11.90

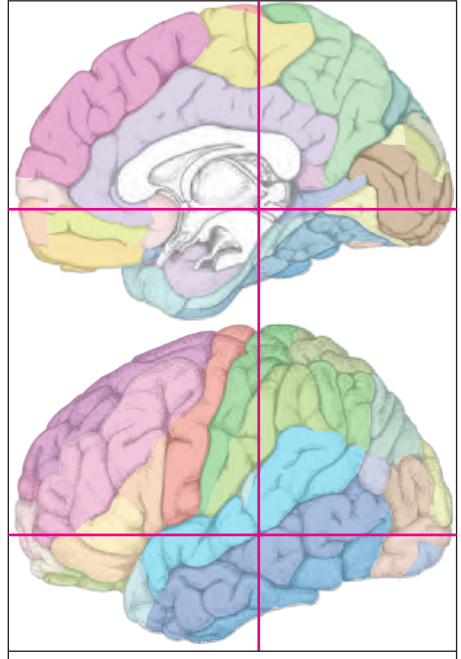


BA1-52 Brodmann areas 1-52 (see p. 101)

3N oculomotor n.
ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus)
alv alveus of the hippocampus
APul anterior (oral) pulvinar nucleus
AV anteroventral nucleus (anteroprincipal nucleus)
bfx body of fornix
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cals callosal sulcus
cc corpus calosum
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
CLi caudal linear n.
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
DG dentate gyrus
DSF dorsal superficial n.
eml external medullary lamina of the thalamus
EW Edinger-Westphal n.
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
hf hippocampal fissure
iml internal medullary lamina of the thalamus
IP interpeduncular n.
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
MD medial dorsal thalamic n.
MDMC mediodorsal thalamic n., magnocellular part
MDPL mediodorsal thalamic n., paralaminar p.
MG medial geniculate n.
ml medial lemniscus
or optic radiation
PaS parasubiculum
pcf paracentral fossa
PF parafascicular thalamic n.
pic posterior limb of the internal capsule
PN paranigral n.
pcs postcentral sulcus
Pons pons
PPA peripeduncular area
PrS presubiculum
Pu putamen
RPC red nucleus, parvicellular p.
Rt reticular thalamic n.
S subiculum
scp superior cerebellar peduncle
SCS subcallosal stratum
sfms superficial medullary stratum
sH Heschl sulcus
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tsv thalamostriate vein
tvt transverse temporal sulcus
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
VPL lateral thalamic ventroposterior n.
xscp decussation of the superior cerebellar peduncle

Cortex: Gyri and Sulci





MNI Position y = -29.53 mm
AHB Position y = 28.20 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos-ph collateral sulcus, phip. ramus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pc posterior commissure
pcf paracentral fossa
sH Heschl sulcus
sts superior temporal sulcus
tvt transverse temporal sulcus

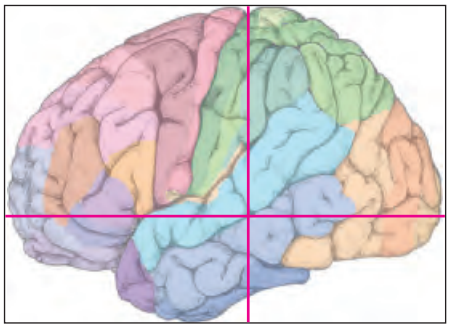
Fibers

3n oculomotor nerve
arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
ctg central tegmental tract
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
mlfc medial longitudinal fasciculus
or optic radiation
pc posterior commissure
pcr posterior corona radiata
pic posterior limb of the internal capsule
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
st stria terminalis
tp tapetum
xscp commissure of the superior cerebellar peduncle

Fiber stain (Weigert)
Section Nr. 55
Slice Nr. 3542

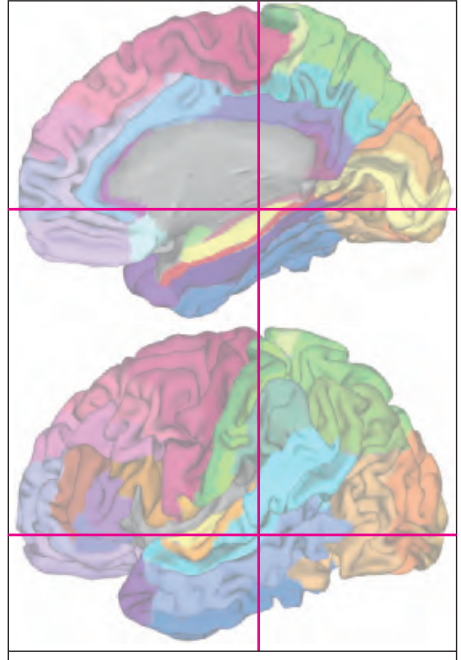
Cortex: Brodmann Areas

MNI: -29.53
ICL: 28.20
MCP: 13.46



BA1-52 Brodmann areas 1-52 (see p. 101)

3N oculomotor n.
ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus)
APul anterior (oral) pulvinar nucleus
Aq cerebral aqueduct (Sylvius)
bfx body of fornix
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
CLi caudal linear n.
CM centromedian thalamic n.
cos-ph collateral sulcus, parahippocampal ramus
cp cerebral peduncle
ctg central tegmental tract
DG dentate gyrus
DSF dorsal superficial n.
eml external medullary lamina of the thalamus
EW Edinger-Westphal n.
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
hf hippocampal fissure
iml internal medullary lamina of the thalamus
IP interpeduncular n.
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
LHb lateral habenular n.
Lim limitans n.
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
MDPC medial dorsal thalamic n.. parvicellular part
MPPL medial dorsal thalamic n.. paralaminar part
MGFi medial geniculate n., fibrosus p.
MGLi medial geniculate n., limitans p.
MGMC medial geniculate n., magnocellular p.
MGPC medial geniculate n., parvicellular p.
MHb medial habenular n.
ml medial lemniscus
or optic radiation
PaS parasubiculum
PBP parabrachial pigmented n.
pc posterior commissure
pic posterior limb of the internal capsule
PN paranigral n.
PPA peripeduncular area
PrS presubiculum
PTc pretectal area
Pu putamen
Rt reticular thalamic n.
S subiculum
SCS subcallosal stratum
sm stria medullaris of thalamus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tp tapetum
TrA triangular area (Wernicke)
tth dorsal trigemino-thalamic tract
tvt transverse temporal sulcus
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
VPL lateral thalamic ventroposterior n.
xscp decussation of the superior cerebellar peduncle



MNI Position y = -29.58 mm
AHB Position y = 28.17 mm

Gyral Pattern

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area
TH hippocampotemporal area

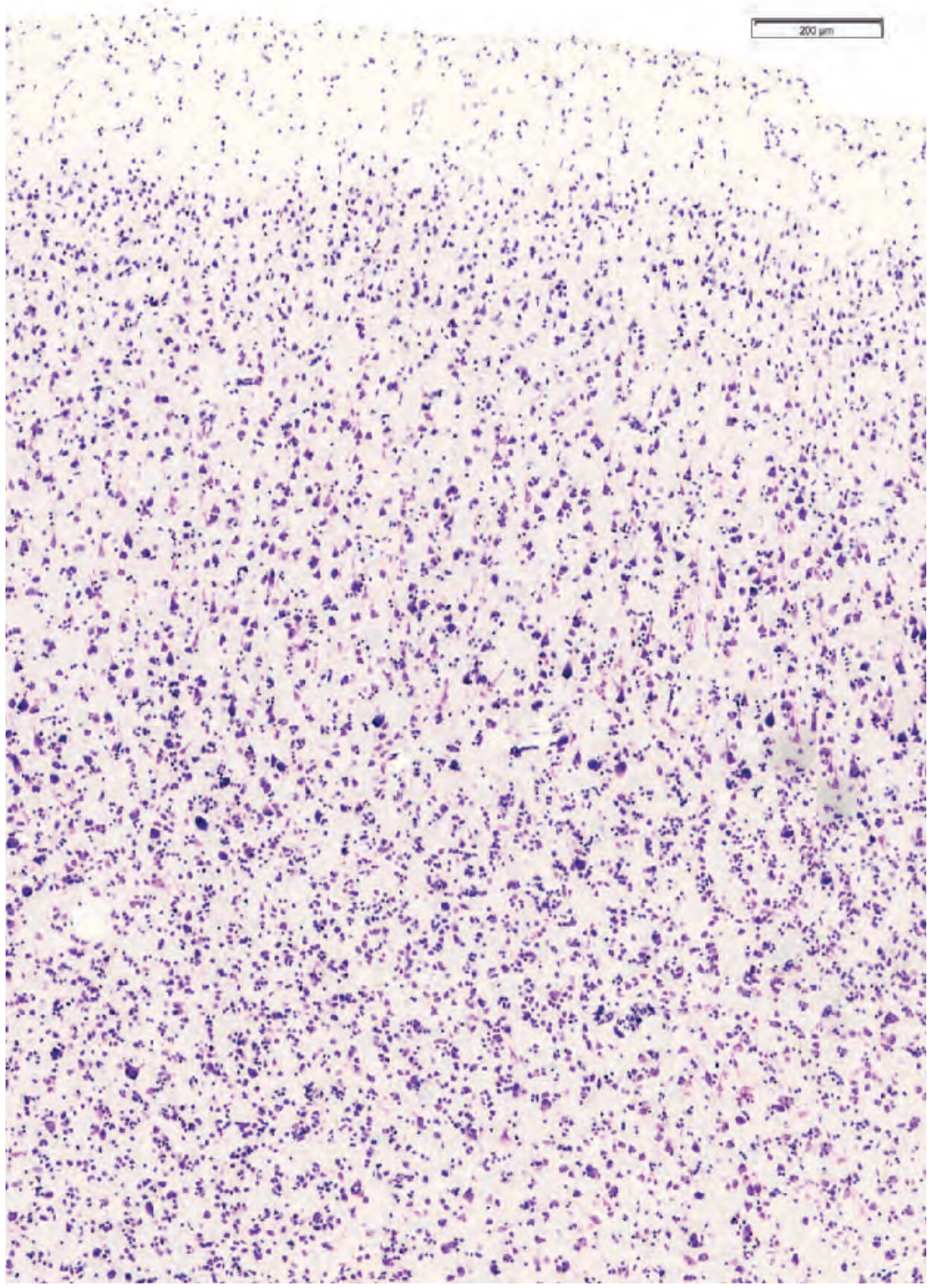
von Economo and Koskinas

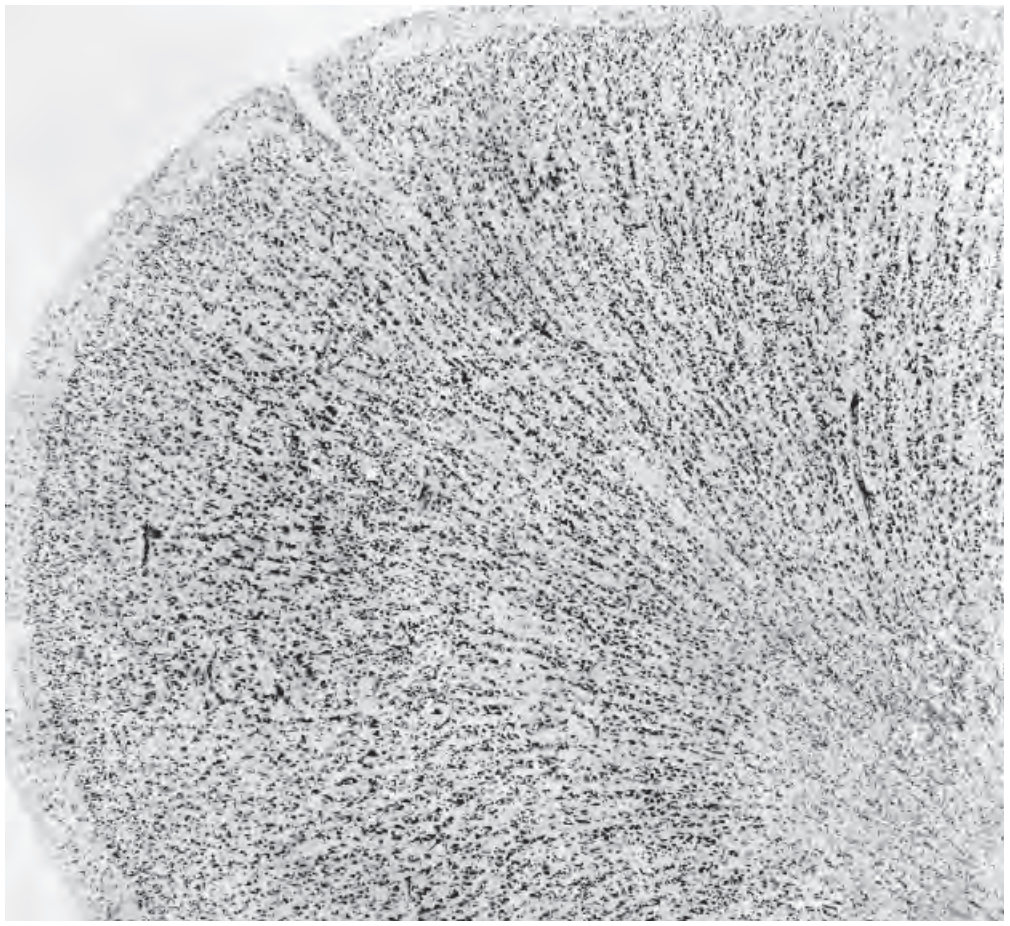
FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
23c subregion of BA 23
24d subregion of BA 24
p24‘ anterior division of BA24
p33‘ posterior subregion of BA33

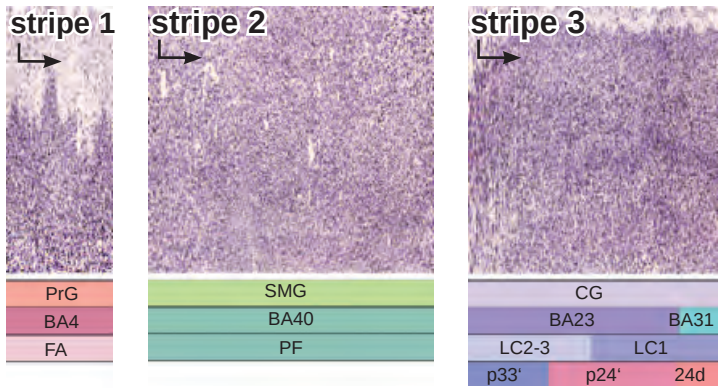
Cell stain (Nissl):
Section Nr. 55
Slice Nr. 3541

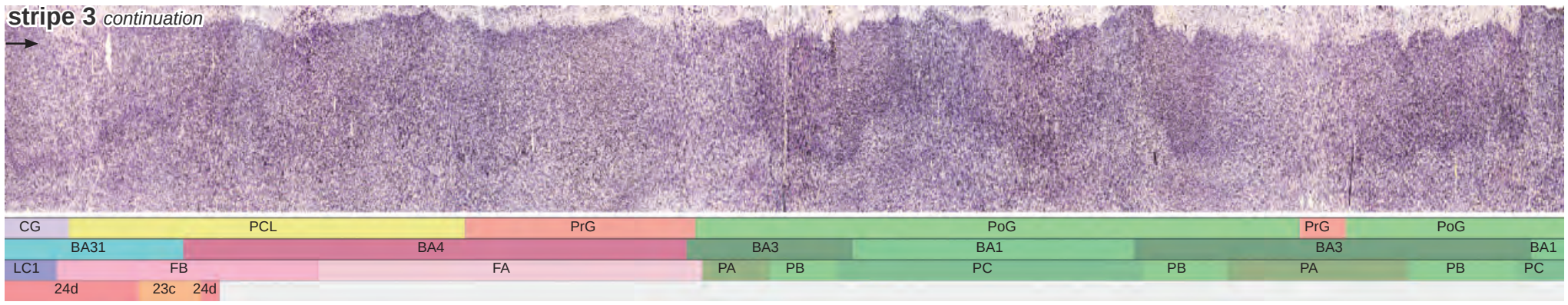


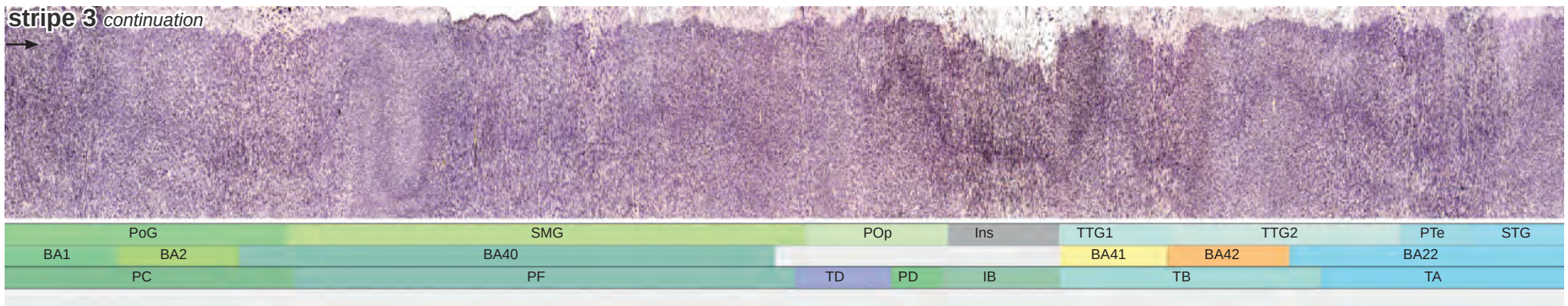


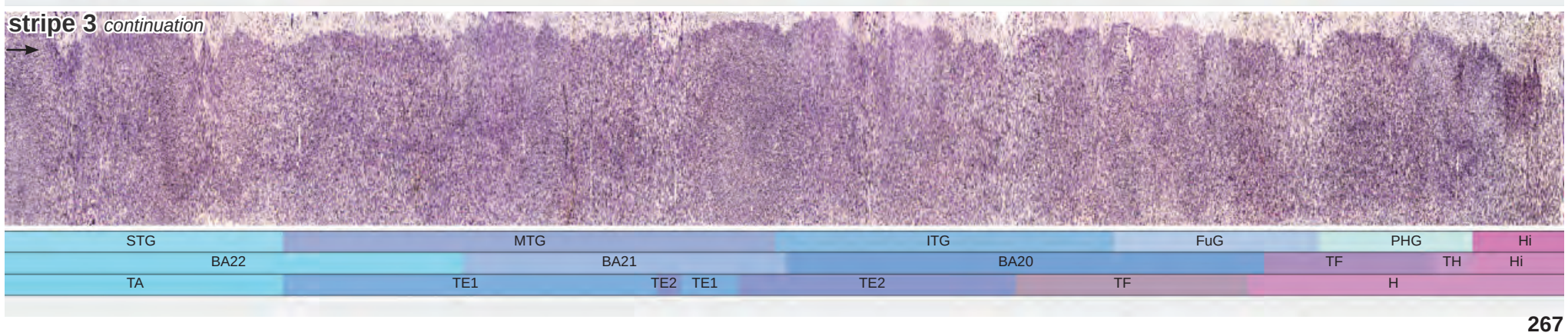
PC Area postcentralis intermedia

von Economo and Koskinas (1925) Plate LXIII (63)

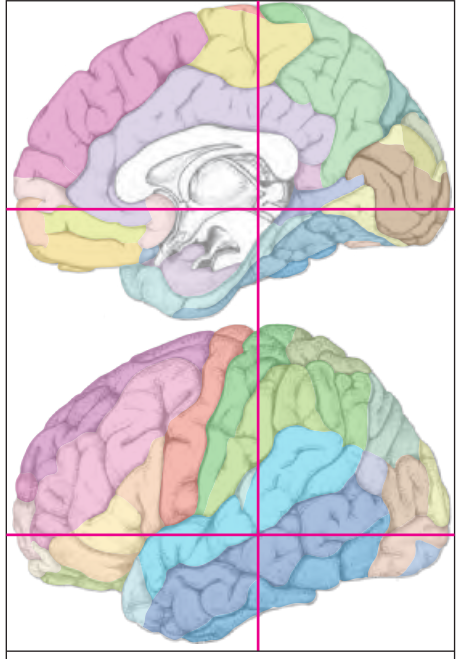








Cortex: Gyri and Sulci



MNI Position y = -30.18 mm
AHB Position y = 28.73 mm

ce
PoG
PrG
PCL
pcf
slf I
PrG
ipocs
PoG
SMG
cgs
slf II
CG
SMG
SMG
pcr
cgb
slf III
cals
sfo
lf
bcc
TTG2
PTe
dhx
bfx
arc
st
POp
cis
sH
TTG1
Ins
eml
iml
pic
fr
mlf
STG
sts
pc
slic
or
st
ml
chf
tp
fi
mlfc
ctg
fds
hf
S
ilf
MTG
PaS
cgh
cp
xscp
ml
its
PHG
ITG
cos
FuG
lots

Fiber stain (Weigert)
Section Nr. 56
Slice Nr. 3562

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus
chf choroid fissure
cis circular sulcus
cos collateral sulcus
fds fimbriodentate sulcus
hf hippocampal fissure
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
sH Heschl sulcus
sts superior temporal sulcus

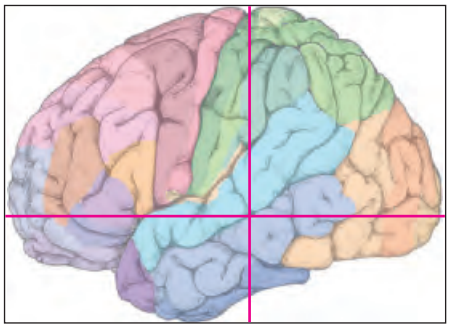
Fibers

arc arcuate fascicle
bcc body of corpus callosum
bfx body of fornix
cgb cingulum bundle
cgh cingulum (hippocampal part)
cp cerebral peduncle
ctg central tegmental tract
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ml medial lemniscus
mlf middle longitudinal fascicle
mlfc medial longitudinal fasciculus
or optic radiation
pc posterior commissure
pcr posterior corona radiata
pic posterior limb of the internal capsule
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
st stria terminalis
tp tapetum
xscp decussation of the superior cereb. peduncles

Cortex: Brodmann Areas

56

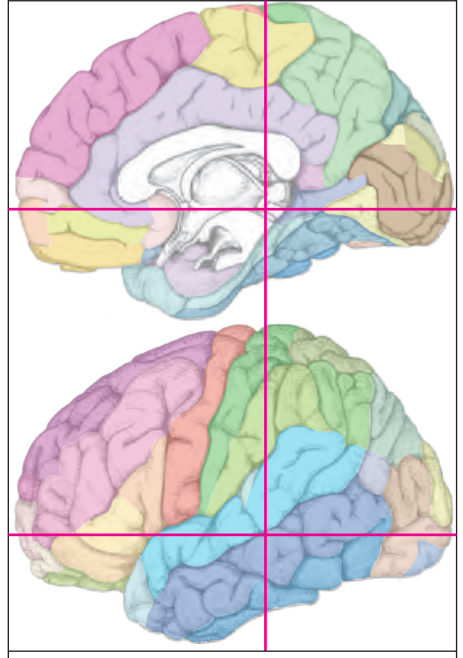
MNI: -30.18
ICL: 28.73
MCP: 13.99



BA1-52 Brodmann areas 1-52 (see p. 101)

3N oculomotor n.
ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus)
APul anterior (oral) pulvinar nucleus
Aq cerebral aqueduct (Sylvius)
bfx body of fornix
bic brachium of the inferior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
CLi caudal linear n.
cos collateral sulcus
ctg central tegmental tract
dhx dorsal hippocampal commissure
DG dentate gyrus
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fr fasciculus retroflexus (fc. habenulo-interpeduncularis)
hbx habenular commissure
hf hippocampal fissure
iml internal medullary lamina of the thalamus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
LHb lateral habenular n.
Lim limitans n.
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LTN lateral terminal n. of the accessory optic system
LV lateral ventricle
MD medial dorsal thalamic n.
MGFi medial geniculate n., fibrosus p.
MGLi medial geniculate n., limitans p.
MGMC medial geniculate n., magnocellular p.
MHb medial habenular n.
ml medial lemniscus
MnR median raphe n.
or optic radiation
PAG periaqueductal gray
PaS parasubiculum
pc posterior commissure
PP peripeduncular n.
PPA peripeduncular area
PrS presubiculum
PTc pretectal area
PTG pedunculotegmental n.
Pu putamen
Rt reticular thalamic n.
S subiculum
SFPul superficial pulvinar n.
SN substantia nigra
SPul superior pulvinar nucleus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
TrA triangular area (Wernicke)
VPb basal ventroposterior n. [VMpo] (entry zone of sensory afferents)
xscp decussation of the superior cerebellar peduncle

Cortex: Gyri and Sulci



MNI Position y = -32.37 mm
AHB Position y = 30.80 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus,
cis circular sulcus
cos collateral sulcus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
sH Heschl sulcus
sts superior temporal sulcus

Fibers

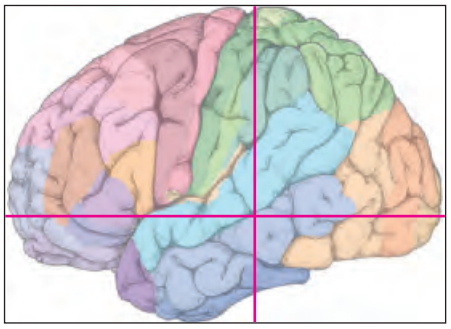
arc arcuate fascicle
bsc brachium of the superior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
ctg central tegmental tract
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
ilf inferior longitudinal fascicle
iml internal medullary lamina of the thalamus
ll lateral lemniscus
ml medial lemniscus
mlf middle longitudinal fascicle
mlfc medial longitudinal fasciculus
or optic radiation
pc posterior commissure
pcr posterior corona radiata
pic posterior limb of the internal capsule
scc splenium of corpus callosum
scp superior cerebellar peduncle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
spth spinothalamic tract
st stria terminalis
tp tapetum
xscp decussation of the superior cereb. peduncles

Fiber stain (Weigert)
Section Nr. 57
Slice Nr. 3639

Cortex: Brodmann Areas

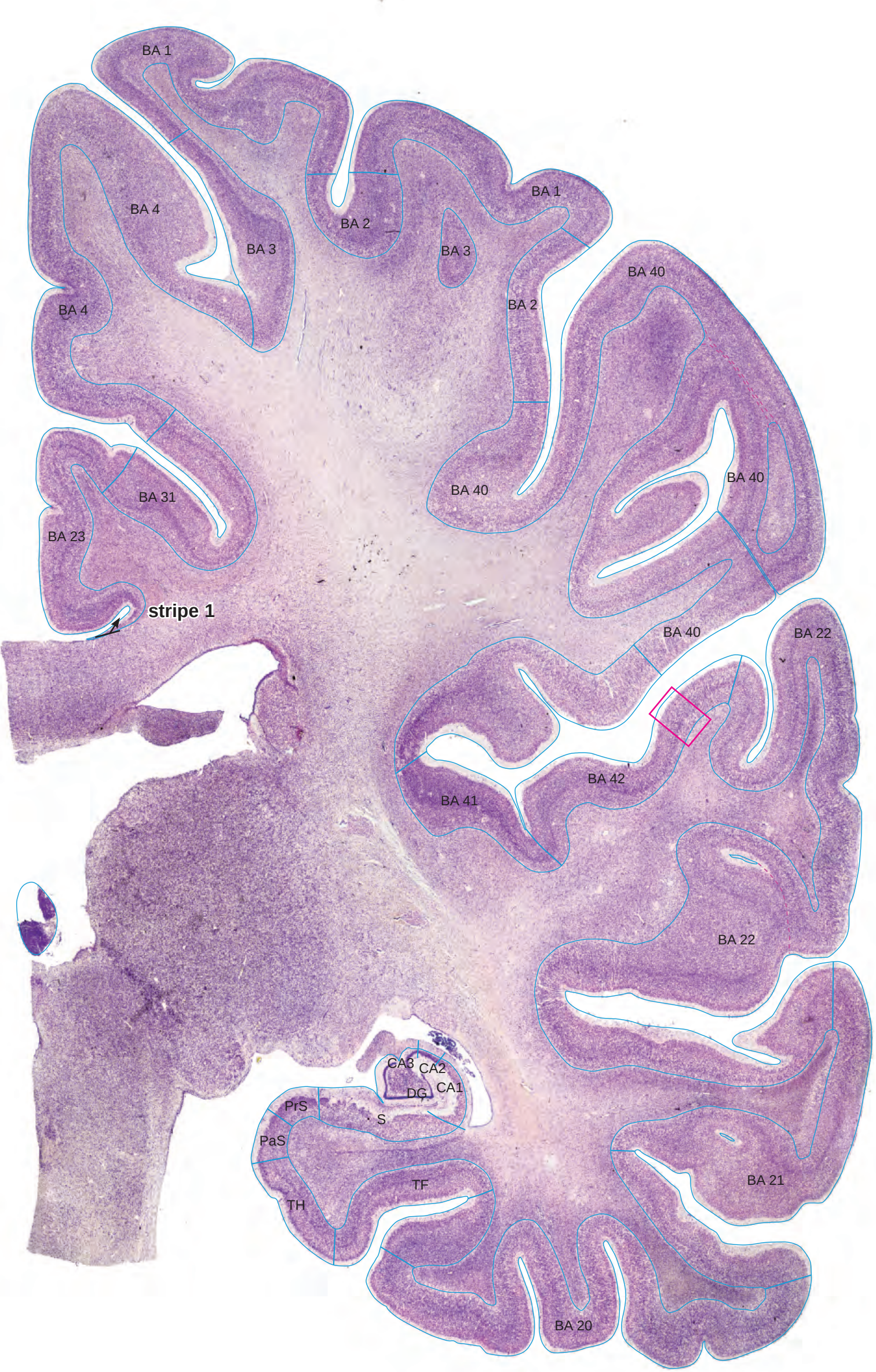
57

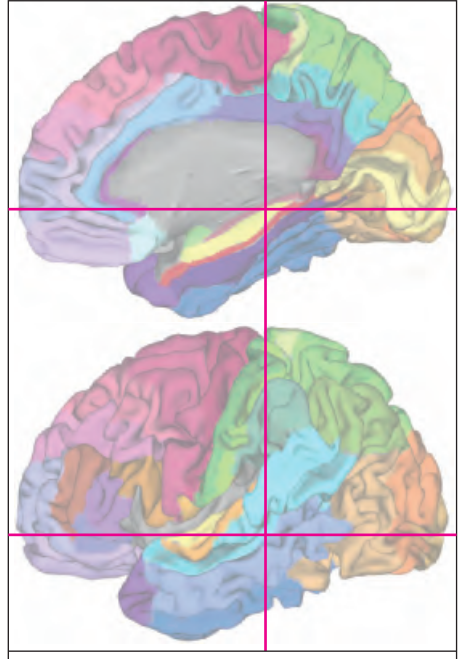
MNI: -32.37
ICL: 30.80
MCP: 16.06



BA1-52 Brodmann areas 1-52 (see p. 101)

3n oculomotor nerve
3N oculomotor n.
APul anterior (oral) pulvinar nucleus
Aq cerebral aqueduct (Sylvius)
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
cc corpus calosum
Cd caudate n.
ce central sulcus
CLi caudal linear n.
cos collateral sulcus
crfx crus of fornix
csc commissure of the superior colliculi
ctg central tegmental tract
DG dentate gyrus
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
IGPul intergeniculatus pulvinar nucleus
iml internal medullary lamina of the thalamus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LG lateral geniculate n.
LHb lateral habenular n.
Lim limitans n.
LPul lateral pulvinar nucleus
LV lateral ventricle
MD medial dorsal thalamic n.
MDe margo denticulatus
MGDP medial geniculate n., dorsal posterior p.
MGFi medial geniculate n., fibrosus p.
MGLi medial geniculate n., limitans p.
mlfc medial longitudinal fasciculus
MnR median raphe n.
MPul medial pulvinar nucleus
or optic radiation
PAG periaqueductal gray
PaS parasubiculum
pc posterior commissure
Pi pineal gland
pic posterior limb of the internal capsule
PrS presubiculum
PTc pretectal area
PTg pedunculotegmental n.
Pu putamen
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scal subcallosal fc
SFPul superficial pulvinar n.
SGe supragenicular n.
sfms superficial medullary stratum
slic sublenticular p. of internal capsule
spth spino-thalamic tract
SPul superior pulvinar nucleus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
xscp decussation of the superior cerebellar peduncle





MNI Position y = -32.37 mm
AHB Position y = 30.82 mm

Gyral Pattern

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area
TH hippocampotemporal area

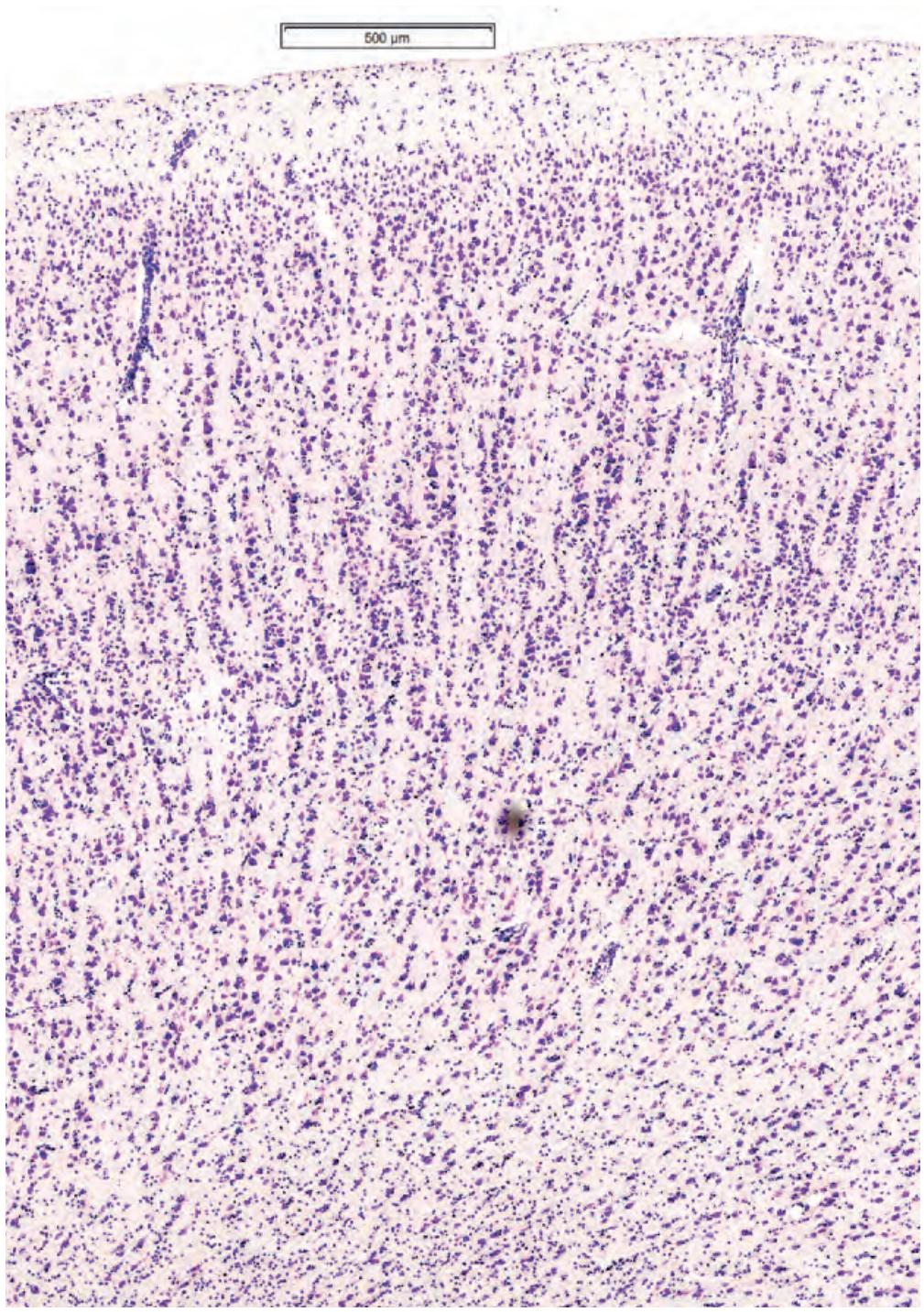
von Economo and Koskinas

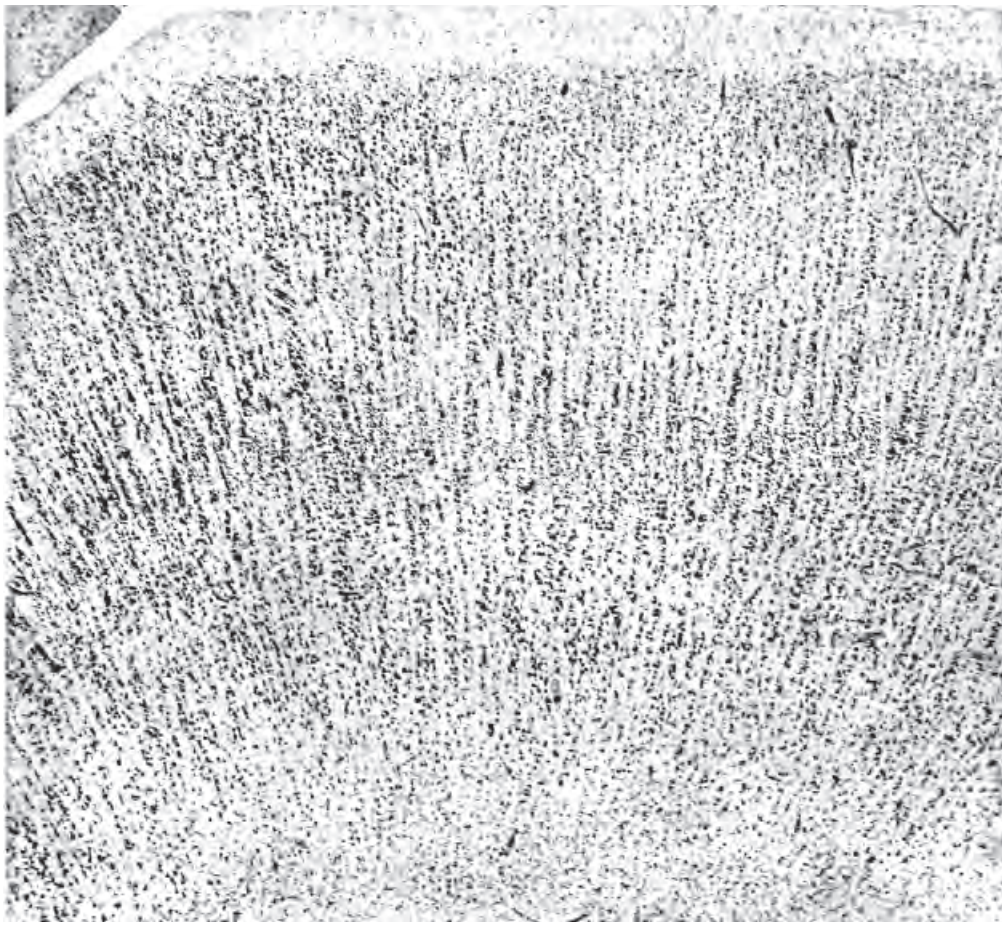
FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PD caudal postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TC supratemporal area granulosa
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
23c subregion of BA 23
23d dorsal division of BA 23
24d subregion of BA 24
p24' anterior division of BA24
p33' posterior subregion of BA33

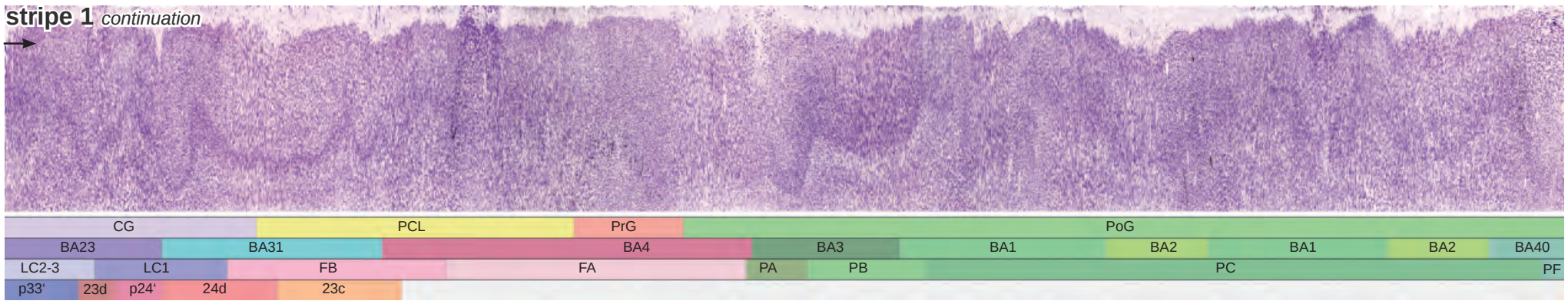
Cell stain (Nissl):
Section Nr. 57
Slice Nr. 3640

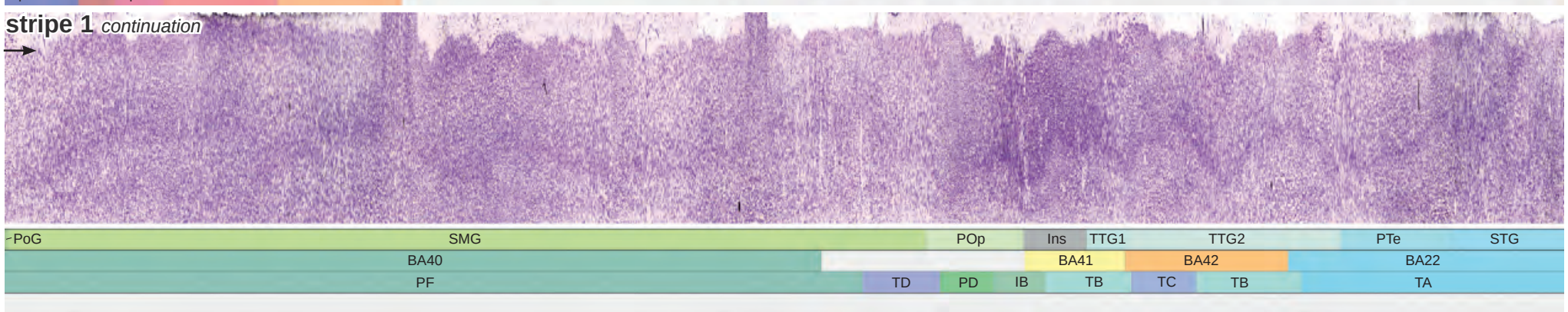


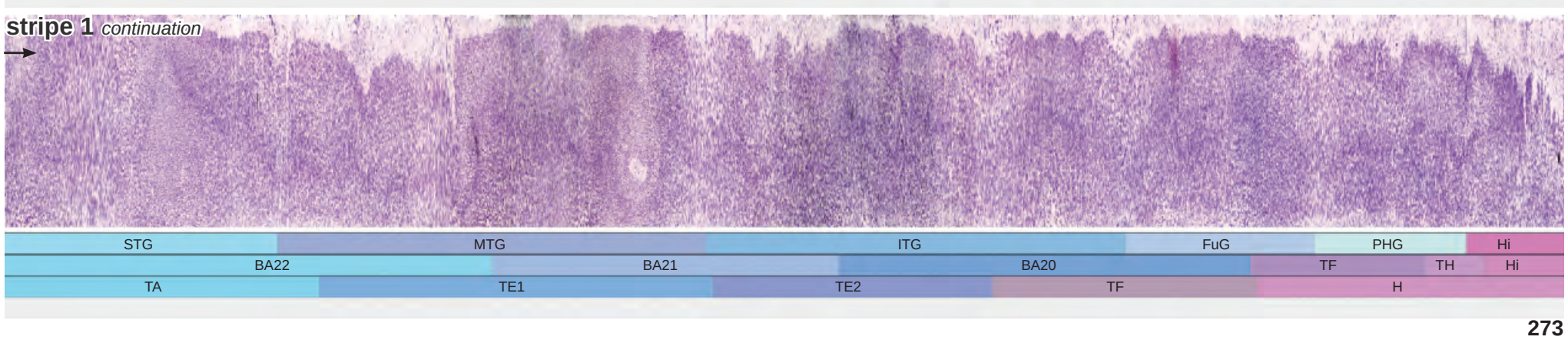


TB Area supratemporalis simplex.

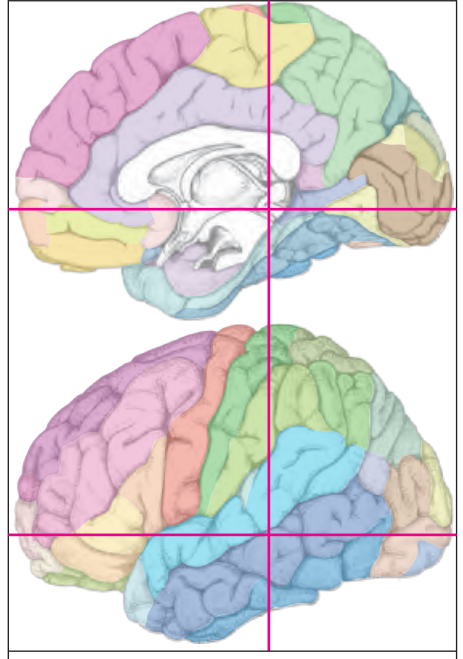
von Economo and Koskinas (1925) Plate XCIII (93)







Cortex: Gyri and Sulci



MNI Position y = -33.78 mm
AHB Position y = 32.11 mm

ce
PrG
PoG
ipocs
pcf
PCL
SMG
slf I
slf II
cgs
CG
SMG
pcr
cgb
slf III
cals
PTe
lf
sfo
arc
scc
POp
TTG2
cis
crfx
Ins
dhx
st
TTG1
eml
mlf
pic
slic
STG
csc
st
sts
bsc
fi
MTG
cmg
tp
spth
bic
PrS
S
ilf
cgh
mlfc
ll
scp
PHG
its
cos
FuG
ITG
lots

Fiber stain (Weigert)
Section Nr. 58
Slice Nr. 3688

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus,
cis circular sulcus
cos collateral sulcus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
sts superior temporal sulcus

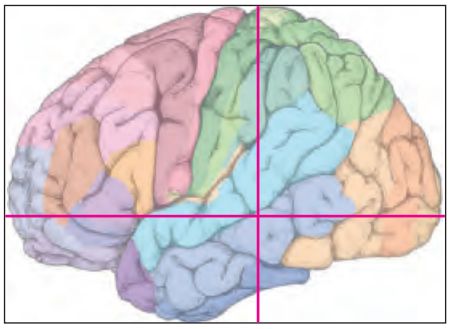
Fibers

arc arcuate fascicle
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
cmg capsule of the medial geniculate n.
crfx crus of fornix
csc commissure of the superior colliculi
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
ilf inferior longitudinal fascicle
ll lateral lemniscus
mlf middle longitudinal fascicle
mlfc medial longitudinal fasciculus
pcr posterior corona radiata
pic posterior limb of the internal capsule
scc splenium of corpus callosum
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
spth spinothalamic tract
st stria terminalis
tp tapetum

Cortex: Brodmann Areas

58

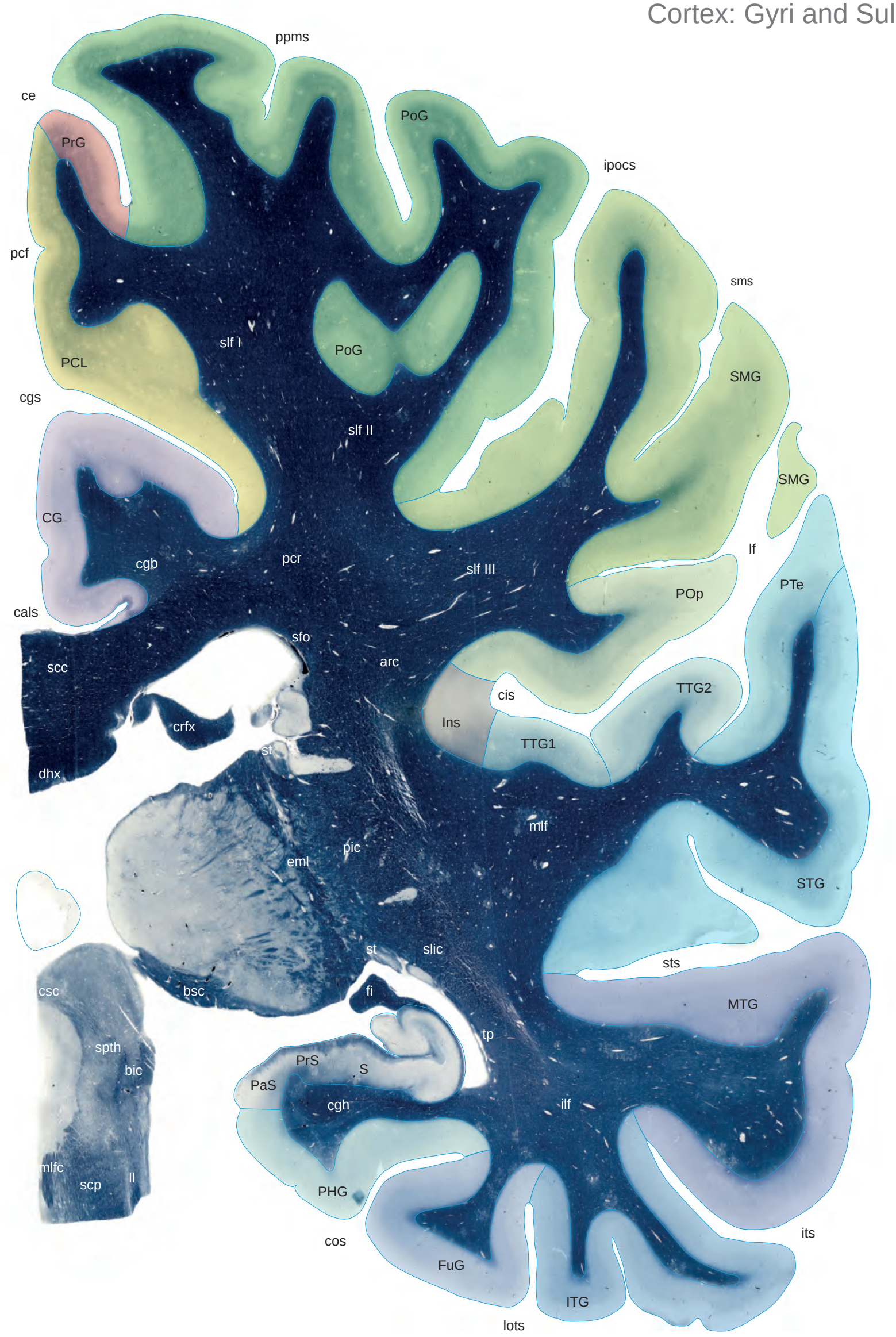
MNI: -33.78
ICL: 32.11
MCP: 17.37

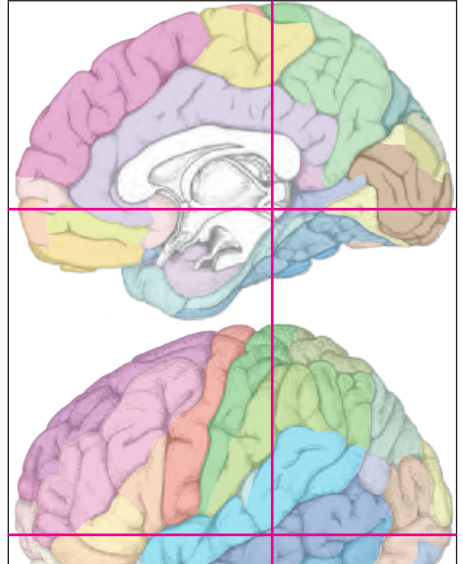


BA1-52 Brodmann areas 1-52 (see p. 101)

Aq cerebral aqueduct (Sylvius)
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
cmg capsule of the medial geniculate n.
cos collateral sulcus
crfx crus of fornix
csc commissure of the superior colliculi
CuA cuneiform area
DG dentate gyrus
dhx dorsal hippocampal commissure
DR dorsal raphe n.
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
hf hippocampal fissure
IC inferior colliculus
IDPul inferior pulvinar nucleus, dorsal p.
ILPul inferior pulvinar nucleus, intermediate p.
its inferior temporal sulcus
IVPul inferior pulvinar nucleus, ventral p.
lf lateral (Sylvian) fissure
Lim limitans n.
ll lateral lemniscus
LPul lateral pulvinar nucleus
LV lateral ventricle
MD medial dorsal thalamic n.
ml medial lemniscus
mlfc medial longitudinal fasciculus
MLPul mediolateral pulvinar nucleus
MnR median raphe n.
MPul medial pulvinar nucleus
PAG periaqueductal gray
PaS parasubiculum
Pi pineal gland
pic posterior limb of the internal capsule
PTc pretectal area
Pu putamen
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scal subcallosal fc
scc splenium of corpus callosum
SCS subcallosal stratum
sfms superficial medullary stratum
SFPul superficial pulvinar n.
SGe supragreniculate n.
slic sublenticular p. of internal capsule
SPul superior pulvinar nucleus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
xscp decussation of the superior cerebellar peduncle

Cortex: Gyri and Sulci





MNI Position y = -35.08 mm
AHB Position y = 33.42 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PaS parasubiculum
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs cingulate sulcus,
cis circular sulcus
cos collateral sulcus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcf paracentral fossa
ppms parietal paramidline sulcus
sms supramarginal sulcus
st stria terminalis
sts superior temporal sulcus

Fibers

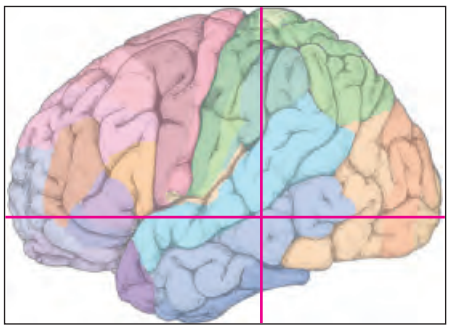
arc arcuate fascicle
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
csc commissure of the superior colliculi
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
ilf inferior longitudinal fascicle
ll lateral lemniscus
mlf middle longitudinal fascicle
mlfc medial longitudinal fasciculus
pcr posterior corona radiata
pic posterior limb of the internal capsule
scc splenium of corpus callosum
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
spth spinothalamic tract
st stria terminalis
tp tapetum

Fiber stain (Weigert)
Section Nr. 59
Slice Nr. 3737

Cortex: Brodmann Areas

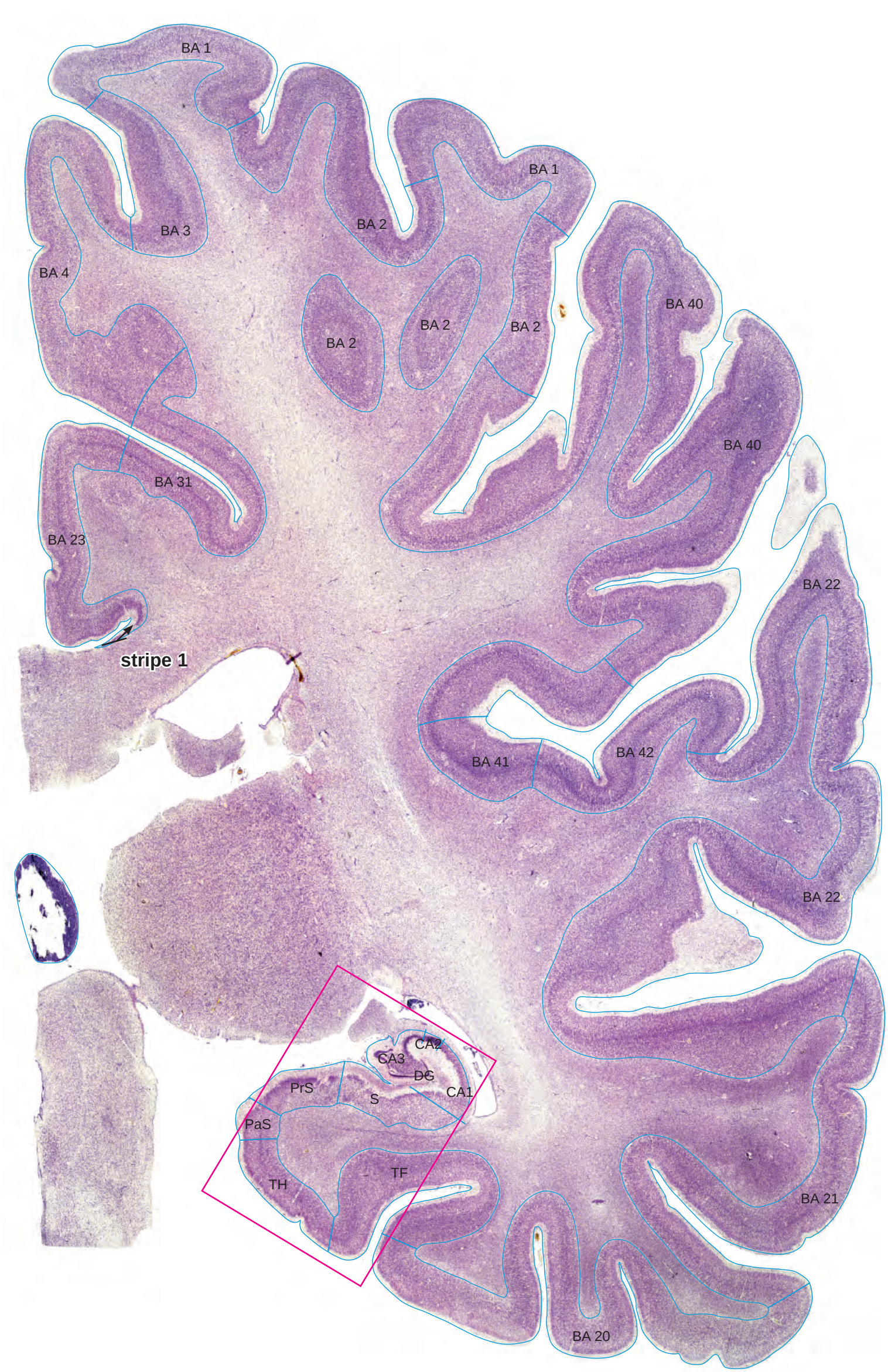
59

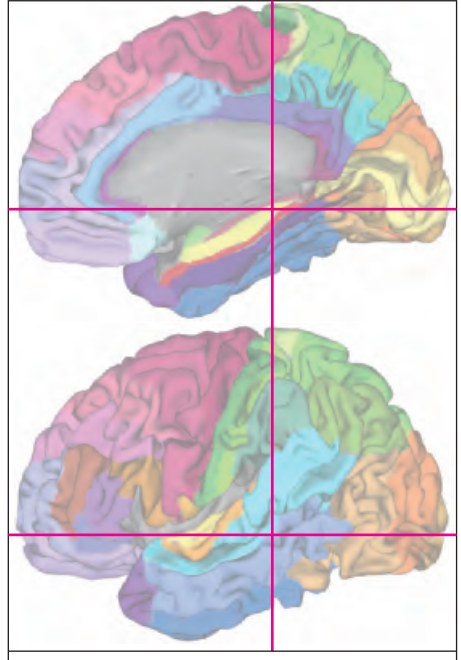
MNI: -35.08
ICL: 33.42
MCP: 18.68



BA1-52 Brodmann areas 1-52 (see p. 101)

Aq cerebral aqueduct (Sylvius)
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
ce central sulcus
cgs cingulate sulcus
cos collateral sulcus
crfx crus of fornix
csc commissure of the superior colliculi
CuF cuneiform n.
DG dentate gyrus
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
hf hippocampal fissure
IDPul inferior pulvinar nucleus, dorsal p.
IGr indusium griseum
ILPul inferior pulvinar nucleus, intermediate p.
ipocs inferior postcentral sulcus
IPul inferior pulvinar nucleus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
MiTg microcellular tegmental n.
ml medial lemniscus
mlfc medial longitudinal fasciculus
MLPul mediolateral pulvinar nucleus
MPul medial pulvinar nucleus
PAG periaqueductal gray
PaS parasubiculum
pcf paracentral fossa
Pi pineal gland
ppms posterior paramidline sulcus
PrCuF precuneiform area
PrS presubiculum
PTg pedunculotegmental n.
Pu putamen
RSC retrosplenial cortex
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scc splenium of corpus callosum
SFPul superficial pulvinar n.
sms spramarginal sulcus
SPul superior pulvinar nucleus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
tfx tenia of fornix
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tsc tenia semicircularis





MNI Position y = -35.13 mm
AHB Position y = 33.45 mm

Gyral Pattern

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
PrS presubiculum
PTe planum temporale
S subiculum
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA41 area temporalis transversa interna (anterior)
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area
TH hippocampotemporal area

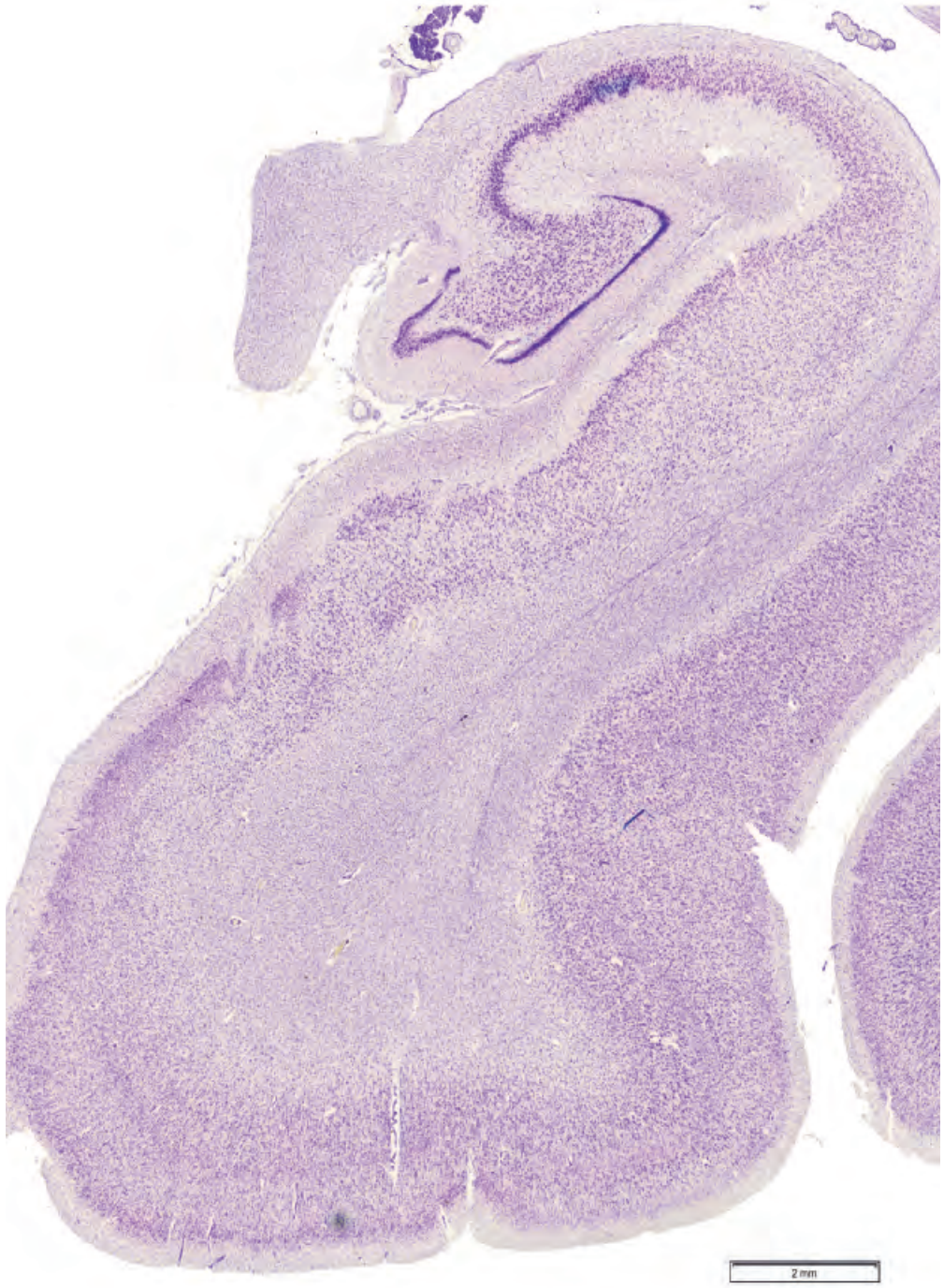
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
IB postcentral insular area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TC supratemporal area granulosa
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

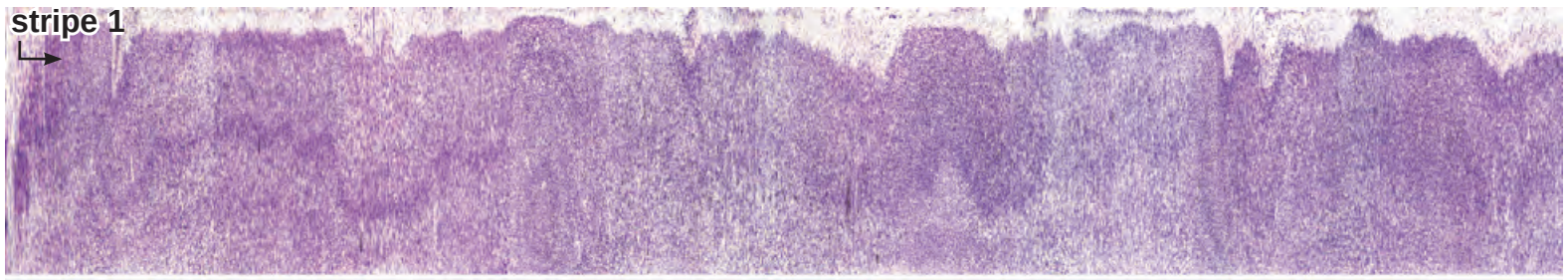
B. Vogt:
23c subregion of BA 23
23d dorsal division of BA 23
29/30 BA 29 and BA30

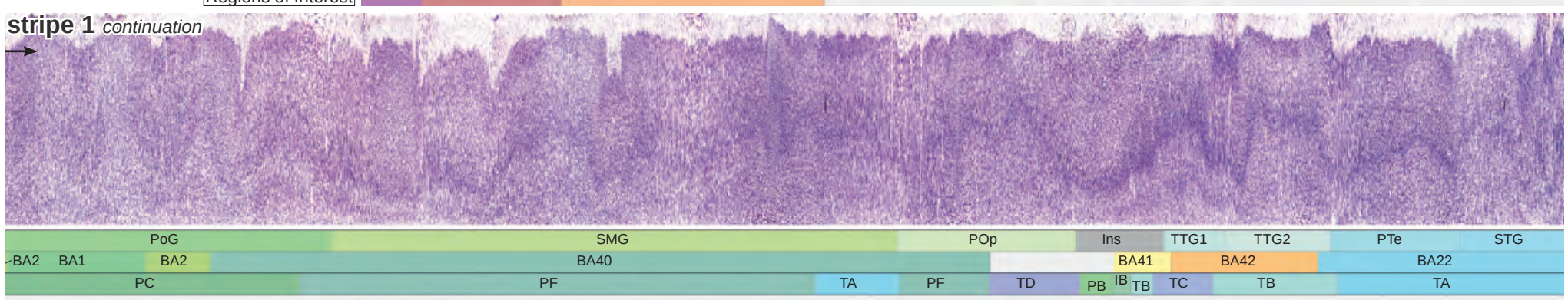
Cell stain (Nissl):
Section Nr. 59
Slice Nr. 3738

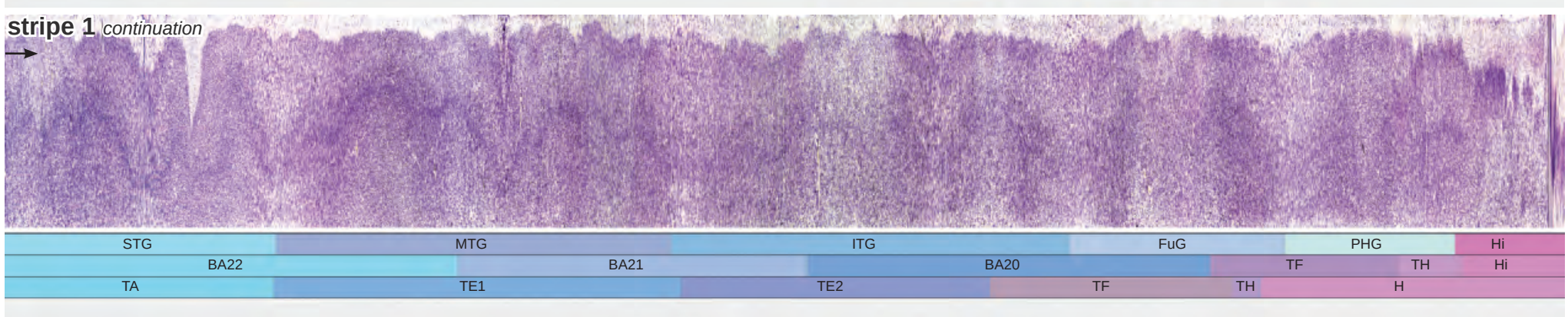


TF Area fusiformis. TH(a) Area temporohippocampica (agranularis). HD(1,2,3) Area praesubicularis granulosa (limitans, media, glomerulosa). HE(1alpha,1ß,2) Area pyramidalis (subiculi glomerulosa, subiculi simplex, ammonica). HF Area dentata.

von Economo and Koskinas (1925) Plate CXII (112)

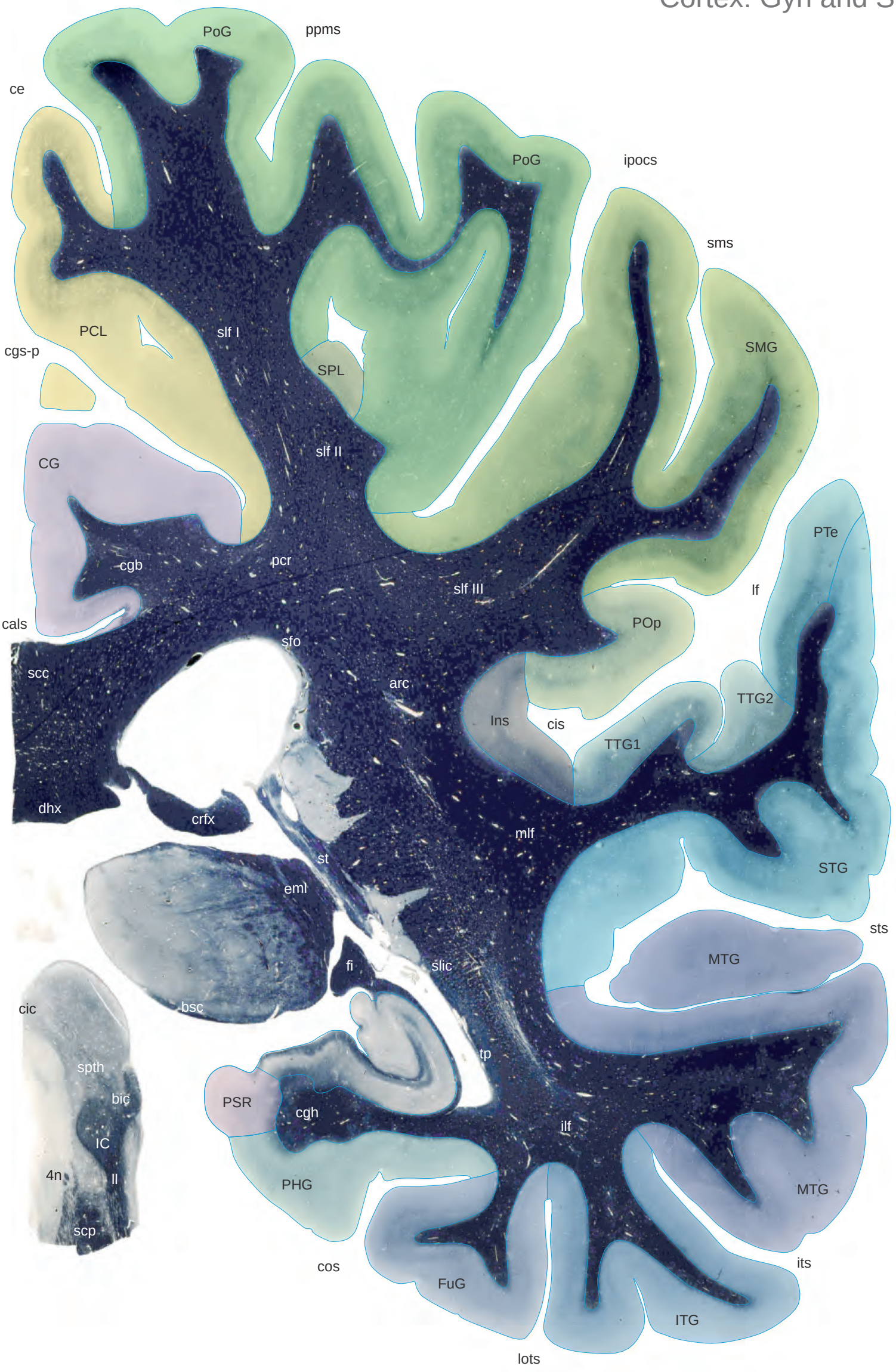


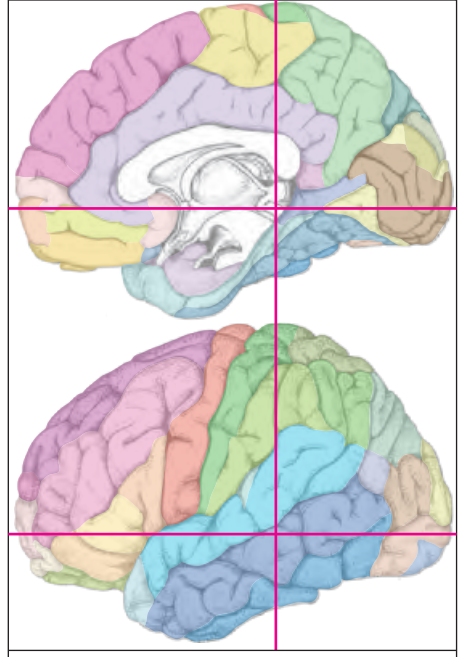




Gyral pattern	CG PCL PrG PoG
Brodmann areas	BA23 BA31 BA4 BA3 BA1 BA2
von Economo	LC2-3 LC1 FB FA PA PB PC
Regions of Interest	29/30 23d 23c

Cortex: Gyri and Sulci





MNI Position y = -36.57 mm
AHB Position y = 34.82 mm

Fiber stain (Weigert)
Section Nr. 60
Slice Nr. 3789

Gyri

CG cingulate gyrus
FuG fusiform gyrus
IC inferior colliculus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PSR perisplenial region
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs-p cingulate sulcus, posterior part
cis circular sulcus
cos collateral sulcus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sms supramarginal sulcus
st stria terminalis
sts superior temporal sulcus

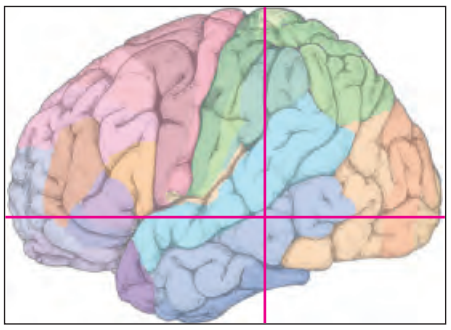
Fibers

4n trochlear nerve
arc arcuate fascicle
bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
cic commissure of the inferior colliculi
crfx crus of fornix
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
ilf inferior longitudinal fascicle
ll lateral lemniscus
mlf middle longitudinal fascicle
pcr posterior corona radiata
scc splenium of corpus callosum
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sms superficial medullary stratum
spth spinothalamic tract
st stria terminalis
tp tapetum

Cortex: Brodmann Areas

60

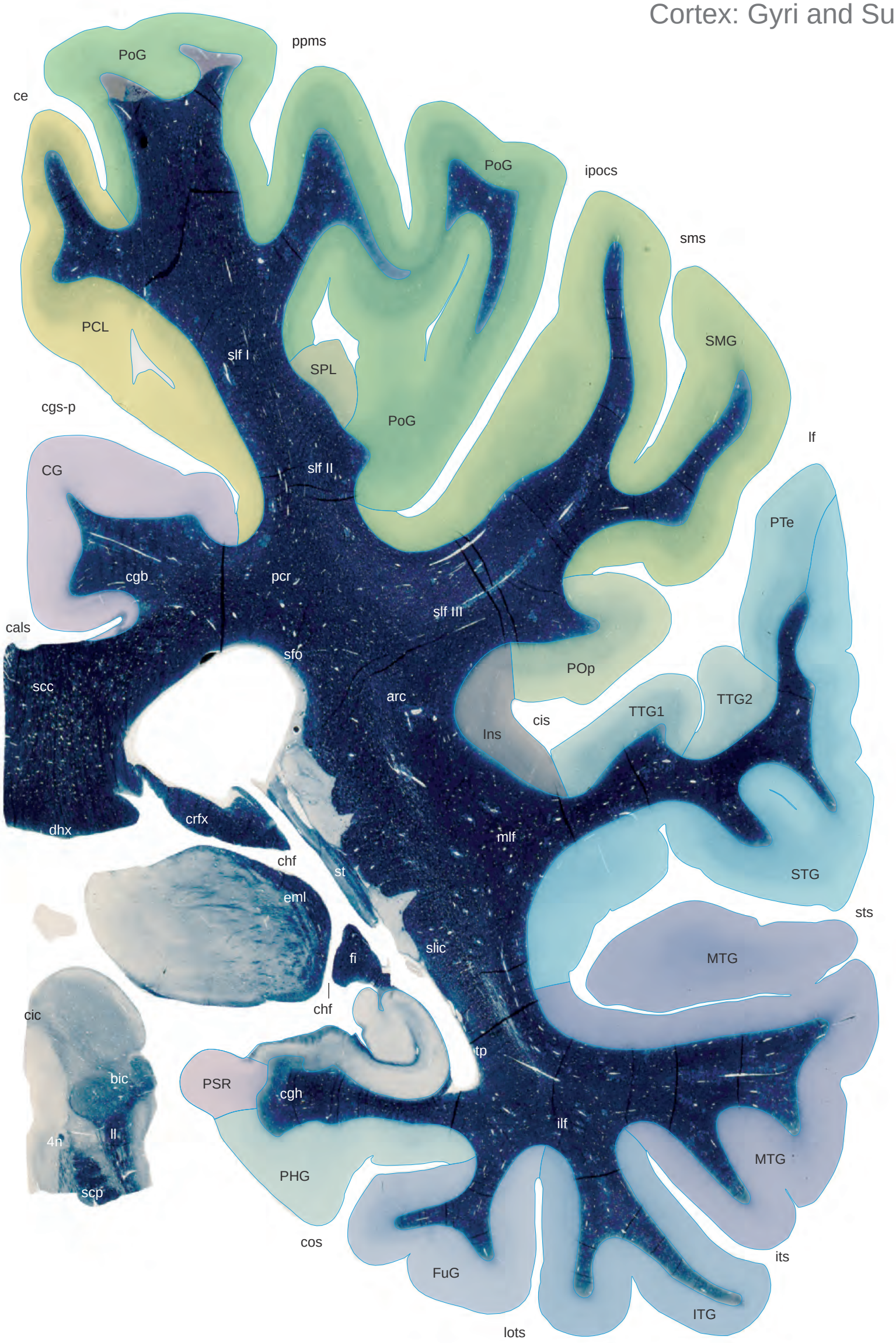
MNI: -36.57
ICL: 34.82
MCP: 20.08

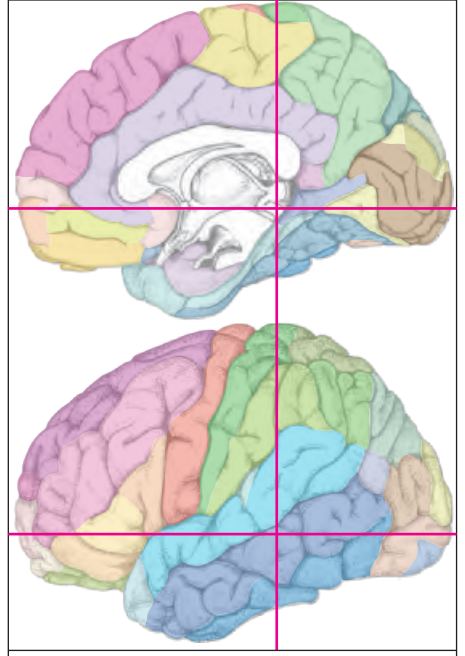


BA1-52 Brodmann areas 1-52 (see p. 101)

bic brachium of the inferior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
ce central sulcus
cgs-p cingulate sulcus, posterior p.
cos collateral sulcus
crfx crus of fornix
CuF cuneiform n.
DG dentate gyrus
dhx dorsal hippocampal commissure
DTg dorsal tegmental n.
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
hf hippocampal fissure
IC inferior colliculus
IDPul inferior pulvinar nucleus, dorsal p.
ipocs inferior postcentral sulcus
its inferior temporal sulcus
LDTg laterodordal tegmental n.
lf lateral (Sylvian) fissure
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
Me5 mesencephalic trigeminal n.
MLPul mediolateral pulvinar nucleus
MPul medial pulvinar nucleus
PAG periaqueductal gray
pcf paracentral fossa
Pi pineal gland
ppms posterior paramidline sulcus
PrS presubiculum
PSR perisplenial region
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scc splenium of corpus callosum
scp superior cerebellar peduncle
SFPul superficial pulvinar n.
sms spramarginal sulcus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle

Cortex: Gyri and Sulci





MNI Position y = -37.13 mm
AHB Position y = 35.16 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PSR perisplenial region
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Sulci

cals callosal sulcus
ce central sulcus
cgs-p cingulate sulcus, posterior part
chf choroid fissure
cis circular sulcus
cos collateral sulcus
ipocs inferior postcentral sulcus
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sms supramarginal sulcus
st stria terminalis
sts superior temporal sulcus

Fibers

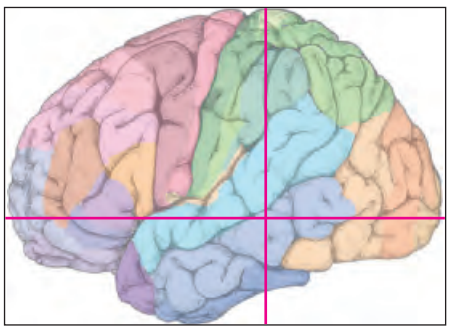
4n trochlear nerve
arc arcuate fascicle
bic brachium of the inferior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
cic commissure of the inferior colliculi
crfx crus of fornix
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
ilf inferior longitudinal fascicle
ll lateral lemniscus
mlf middle longitudinal fascicle
pcr posterior corona radiata
scc splenium of corpus callosum
scp superior cerebellar peduncle
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sms superficial medullary stratum
st stria terminalis
tp tapetum

Fiber stain (Weigert)
Section Nr. 61
Slice Nr. 3802

Cortex: Brodmann Areas

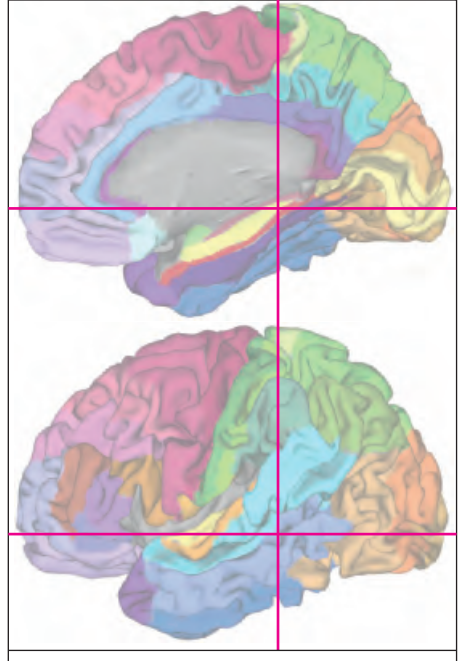
61

MNI: -37.13
ICL: 35.16
MCP: 20.42



BA1-52 Brodmann areas 1-52 (see p. 101)

bic brachium of the inferior colliculus
bsc brachium of the superior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
Cd caudate n.
ce central sulcus
cgs-p cingulate sulcus, posterior p.
cis circular insular sulcus
cos collateral sulcus
crfx crus of fornix
CuF cuneiform n.
DG dentate gyrus
dhx dorsal hippocampal commissure
DTg dorsal tegmental n.
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
hf hippocampal fissure
IC inferior colliculus
IDPul inferior pulvinar nucleus, dorsal p.
ILPul inferior pulvinar nucleus, intermediate p.
ipocs inferior postcentral sulcus
IPul inferior pulvinar nucleus
its inferior temporal sulcus
lf lateral (Sylvian) fissure
LDTg laterodordal tegmental n.
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
Me5 mesencephalic trigeminal n.
MLPul mediolateral pulvinar nucleus
MPul medial pulvinar nucleus
PAG periaqueductal gray
Pi pineal gland
ppms posterior paramidline sulcus
PrS presubiculum
PSR perisplenial region
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scc splenium of corpus callosum
scp superior cerebellar peduncle
SFPul superficial pulvinar n.
sms spramarginal sulcus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TH parahippocampal area TH
TLV temporal horn of lateral ventricle
tsv thalamostriate vein



MNI Position y = -37.44 mm
AHB Position y = 35.65 mm

Gyral Pattern

CG cingulate gyrus
FuG fusiform gyrus
IC inferior colliculus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PrS presubiculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temp. gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA5 area praeparietalis
BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area

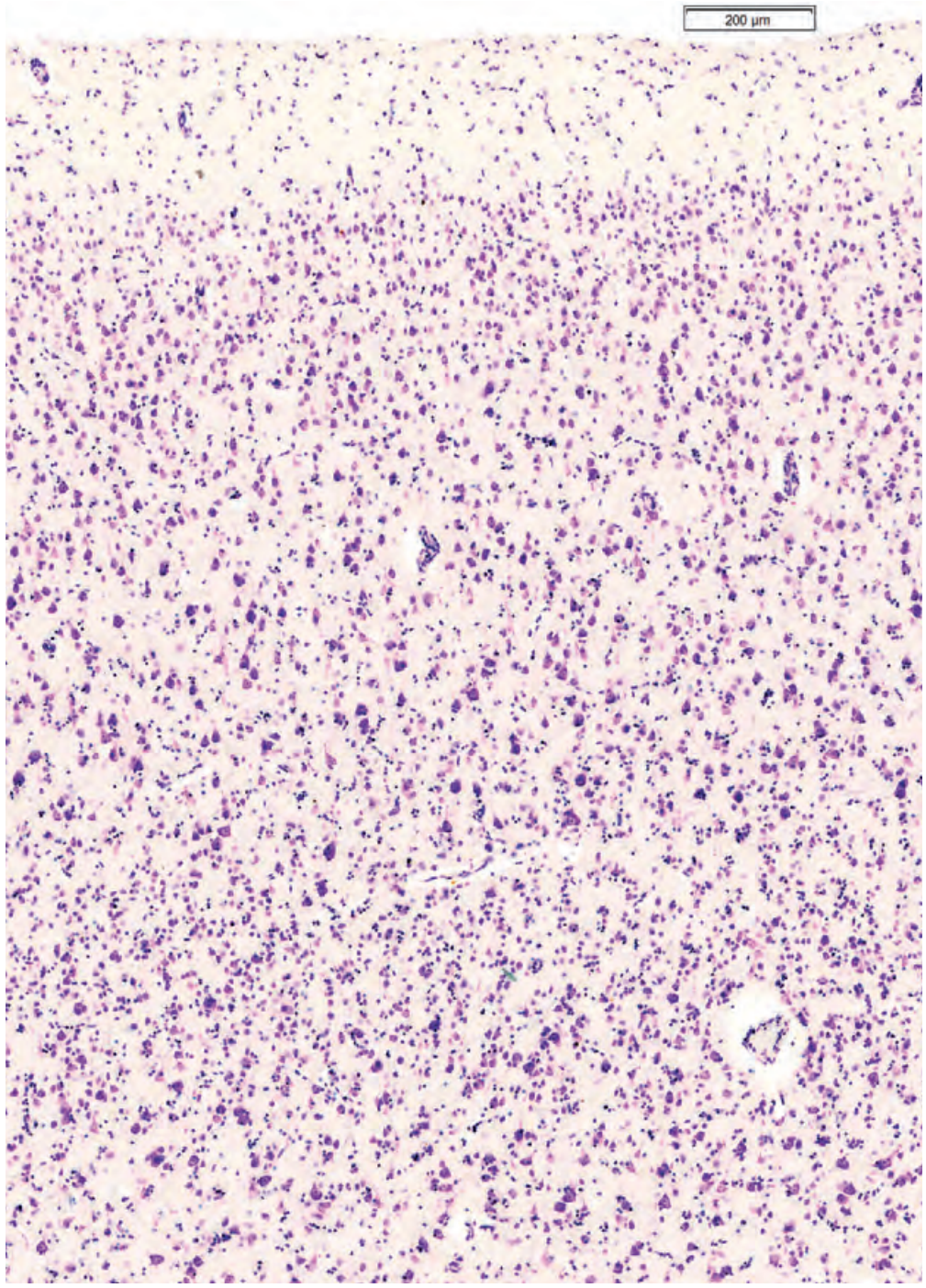
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TC supratemporal area granulosa
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

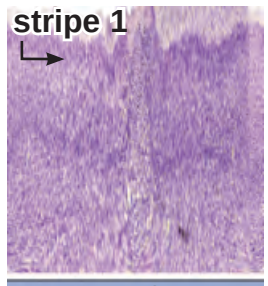
Regions of Interest

B. Vogt:
23c subregion of BA 23
23d dorsal division of BA 23
29/30 BA 29 and BA30

Cell stain (Nissl):
Section Nr. 61
Slice Nr. 3820

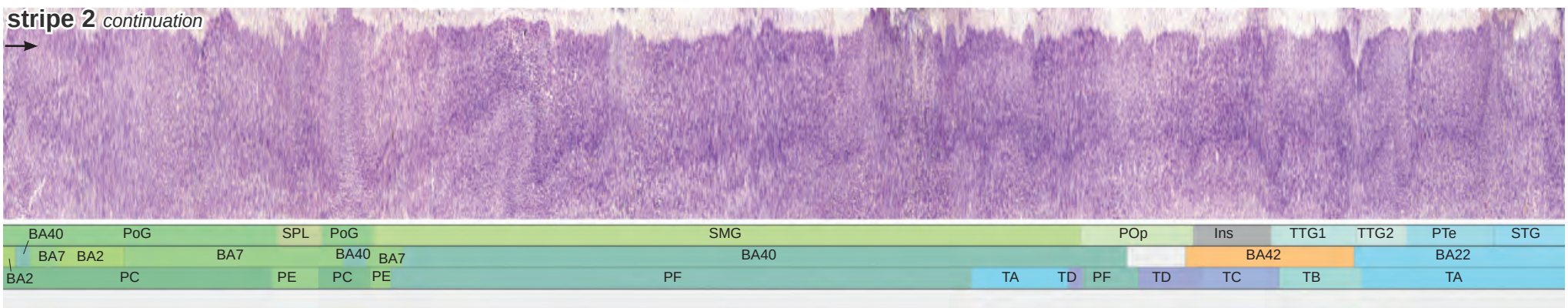


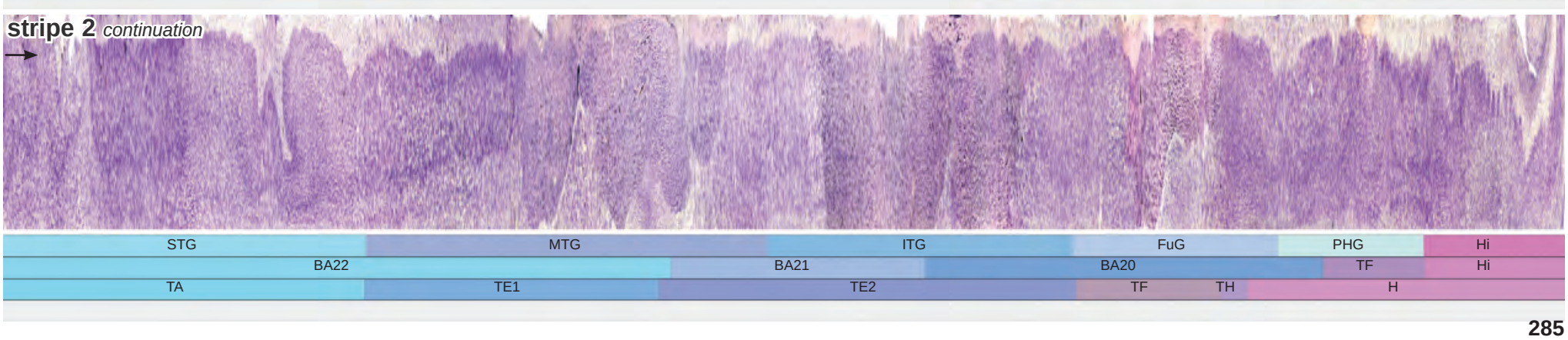
PE(D) Area parietalis superior (postcentralis).
von Economo and Koskinas (1925) Plate LXV (65b)



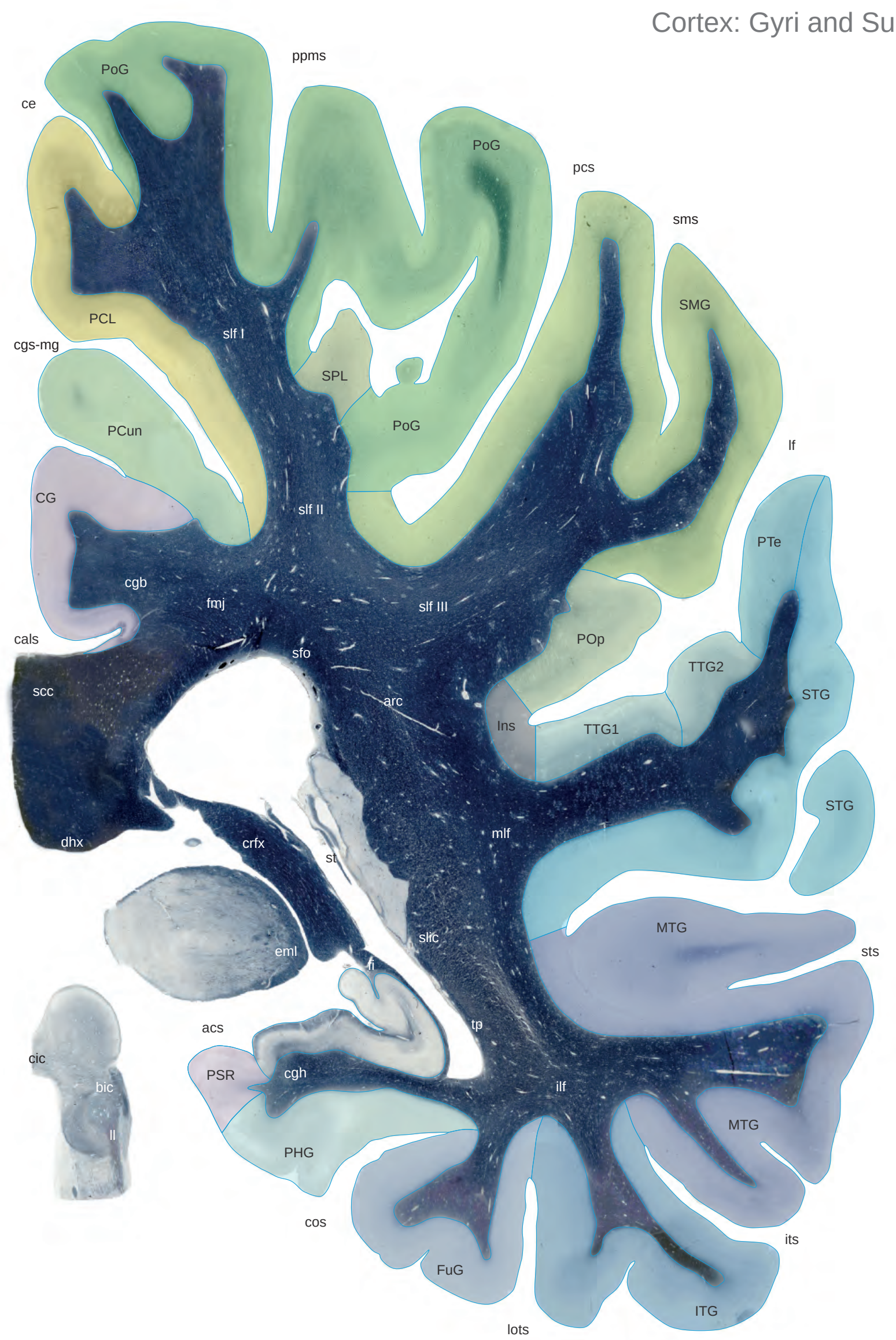
Gyral pattern
Brodmann areas
von Economo
Regions of Interest

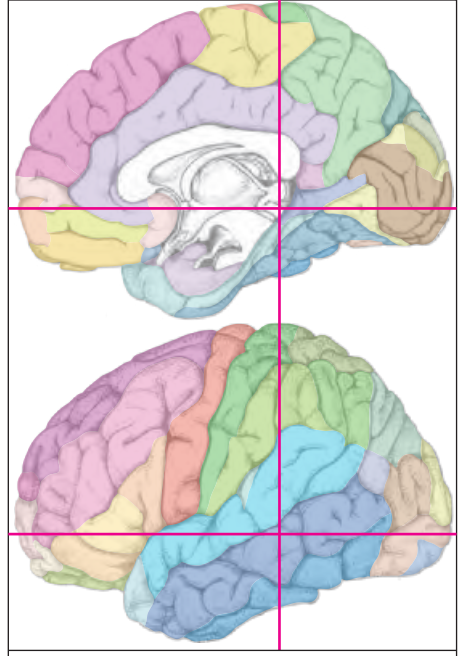
MTG
BA21
TE1





Cortex: Gyri and Sulci





MNI Position y = -37.95 mm
AHB Position y = 36.21 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
IC inferior colliculus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PSR perisplenial region
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
ce central sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
pcs postcentral sulcus
ppms parietal paramidline sulcus
sms supramarginal sulcus
st stria terminalis
sts superior temporal sulcus

Fibers

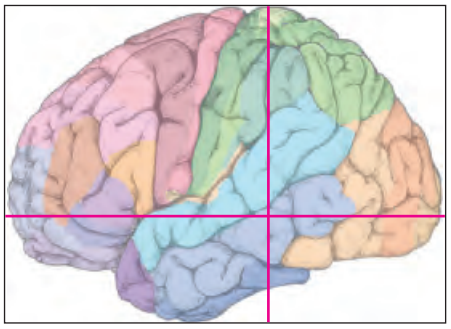
arc arcuate fascicle
bic brachium of the inferior colliculus
cgb cingulum bundle
cgh cingulum (hippocampal part)
cic commissure of the inferior colliculi
crfx crus of fornix
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
fi fimbria of the hippocampus
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
ll lateral lemniscus
mlf middle longitudinal fascicle
scc splenium of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sms superficial medullary stratum
st stria terminalis
tp tapetum

Fiber stain (Weigert)
Section Nr. 62
Slice Nr. 3841

Cortex: Brodmann Areas

62

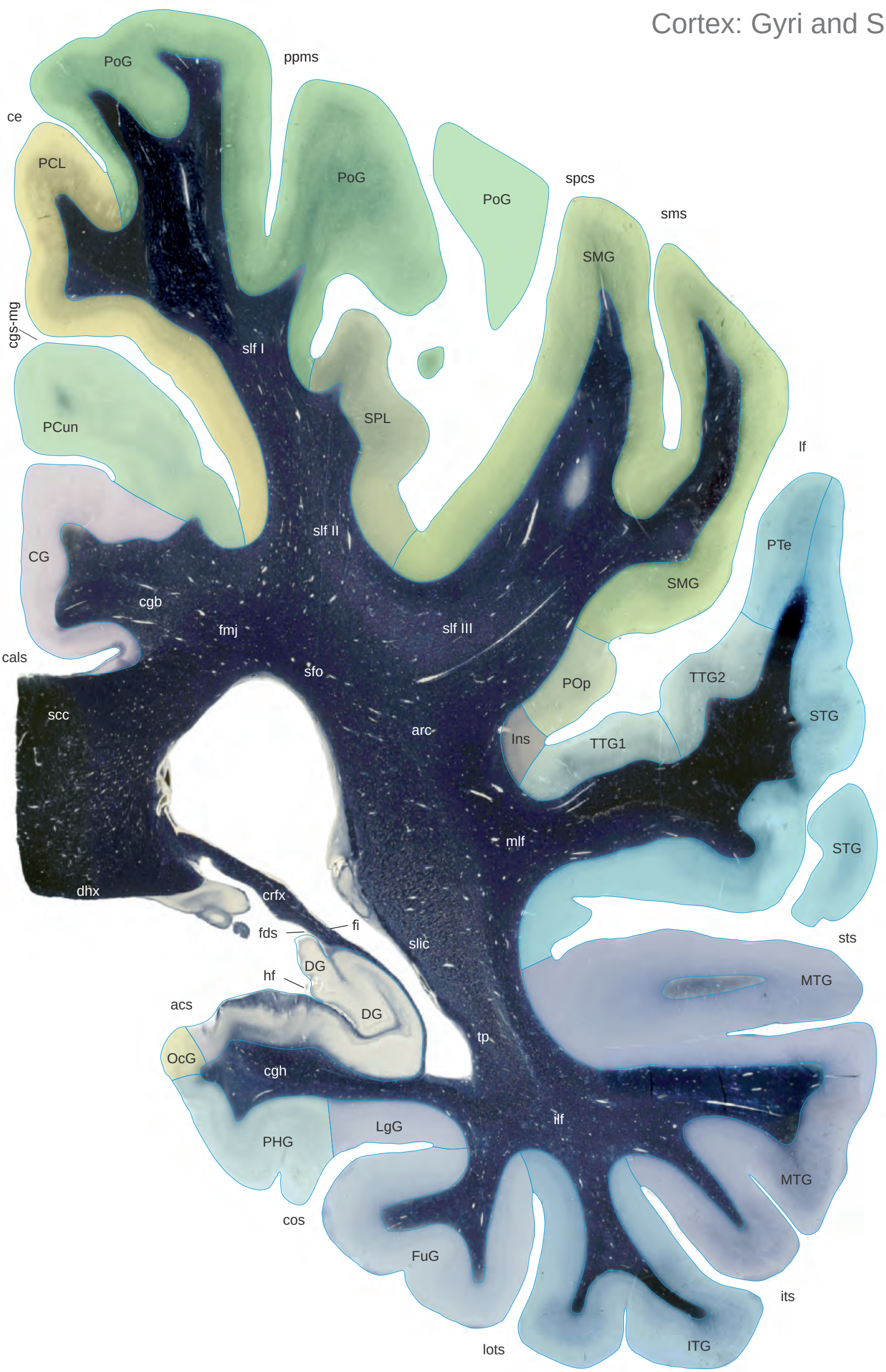
MNI: -37.95
ICL: 36.21
MCP: 21.47

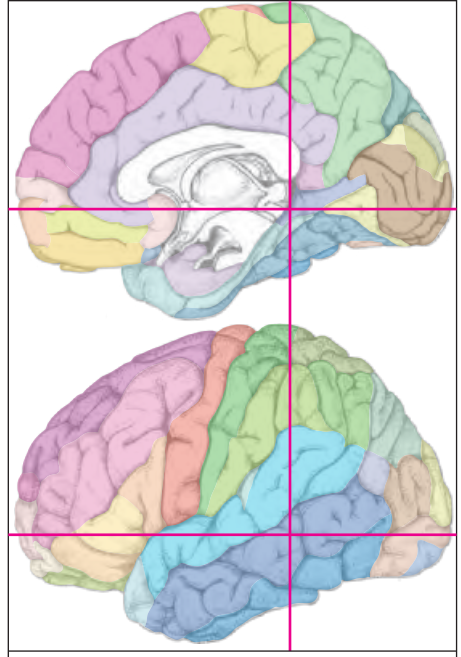


BA1-52 Brodmann areas 1-52 (see p. 101)

bic brachium of the inferior colliculus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
cic commissure of the inferior colliculi
cis circular insular sulcus
cos collateral sulcus
crfx crus of fornix
DG dentate gyrus
dhx dorsal hippocampal commissure
eml external medullary lamina of the thalamus
IC inferior colliculus
ILPul inferior pulvinar nucleus, intermediate p.
ipocs inferior postcentral sulcus
IPul inferior pulvinar nucleus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
LPul lateral pulvinar nucleus
LV lateral ventricle
MLPul mediolateral pulvinar nucleus
MPul medial pulvinar nucleus
PAG periaqueductal gray
PBG parabigeminal n.
ppms posterior paramidline sulcus
PrS presubiculum
PSR perisplenial region
Rt reticular thalamic n.
S subiculum
SC superior colliculus
scc splenium of corpus callosum
SFPul superficial pulvinar n.
sms spramarginal sulcus
st stria terminalis
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TLV temporal horn of lateral ventricle
tsv thalamostriate vein

Cortex: Gyri and Sulci





MNI Position y = -42.31 mm
AHB Position y = 40.28 mm

Gyri

CG cingulate gyrus
DG dentate gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
ce central sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fds fimbriodentate sulcus
hf hippocampal fissure
its inferior temporal sulcus
lf lateral fissure
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sms supramarginal sulcus
sts superior temporal sulcus

Fibers

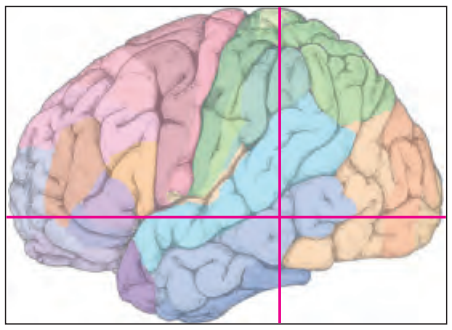
arc arcuate fascicle
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
dhx dorsal hippocampal commissure
fi fimbria of the hippocampus
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
mlf middle longitudinal fascicle
scc splenium of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
slic sublenticular part of internal capsule
sms superficial medullary stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 63
Slice Nr. 3993

Cortex: Brodmann Areas

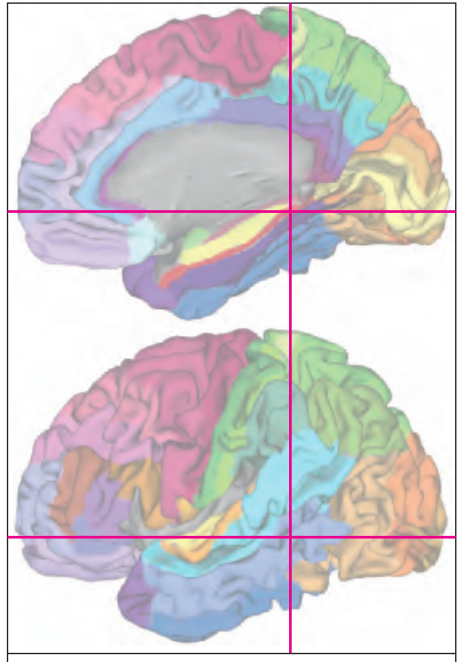
63

MNI: -42.31
ICL: 40.28
MCP: 25.54



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
ARG Andreas Retzii gyrus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
crfx crus of fornix
dhx dorsal hippocampal commissure
DG dentate gyrus
IGr indusium griseum
its inferior temporal sulcus
lf lateral (Sylvian) fissure
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
PrS presubiculum
PSR perisplenial region
S subiculum
scc splenium of corpus callosum
sms spramarginal sulcus
spcs superior postcentral sulcus
sts superior temporal sulcus
TCd tail of caudate n.
TF parahippocampal area TF
TrLV trigone of lateral ventricle



MNI Position y = -42.79 mm
AHB Position y = 40.74 mm

stripe 1

BA 1
BA 5
BA 5
BA 4
BA 3
BA 7
BA 7
BA 5
BA 7
BA 40
BA 31
BA 7
BA 40
BA 40
BA 23
BA 22
BA 40
BA 42
BA 22
BA 22
CA3
CA2
BA 21
BA 21
PrS
S
CA1
DG
PSR
TF
BA 21
BA 20
BA 20

Gyral Pattern

CG cingulate gyrus
DG dentate gyrus
FG fasciolar gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA5 area praeparietalis
BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area

von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TC supratemporal area granulosa
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

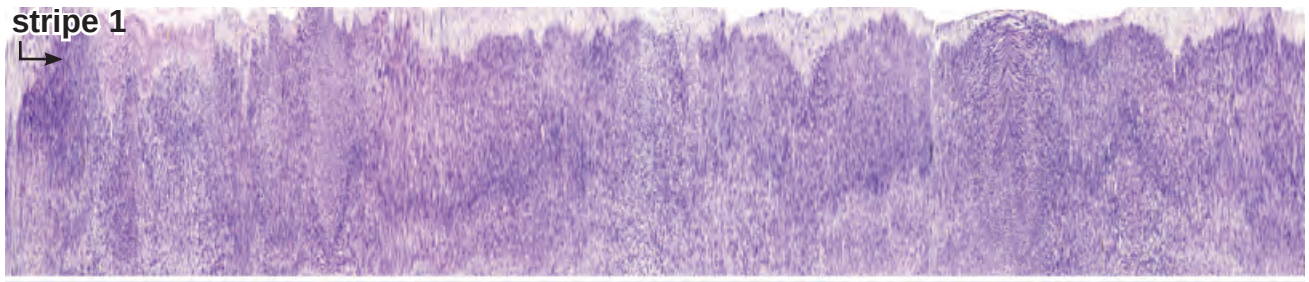
Regions of Interest

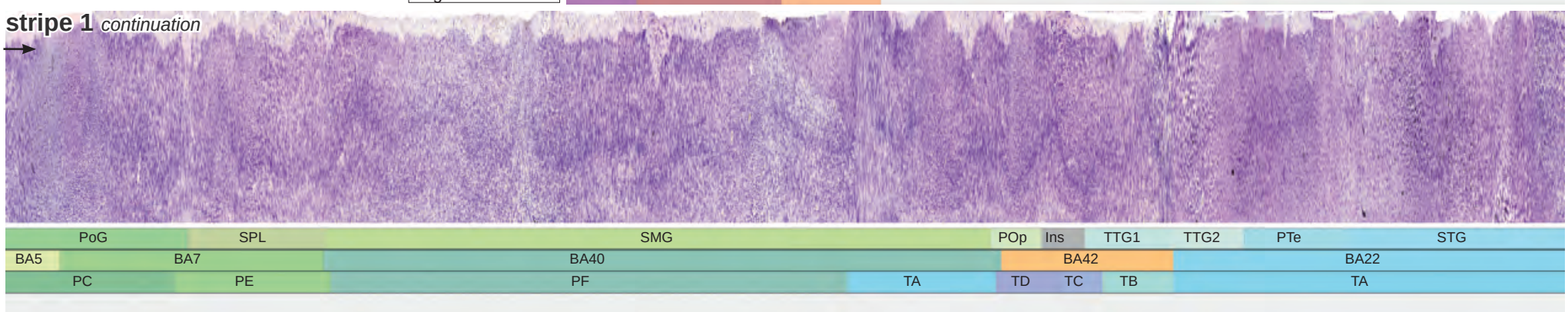
B. Vogt:
23c subregion of BA 23
23d dorsal division of BA 23
29/30 BA 29 and BA30

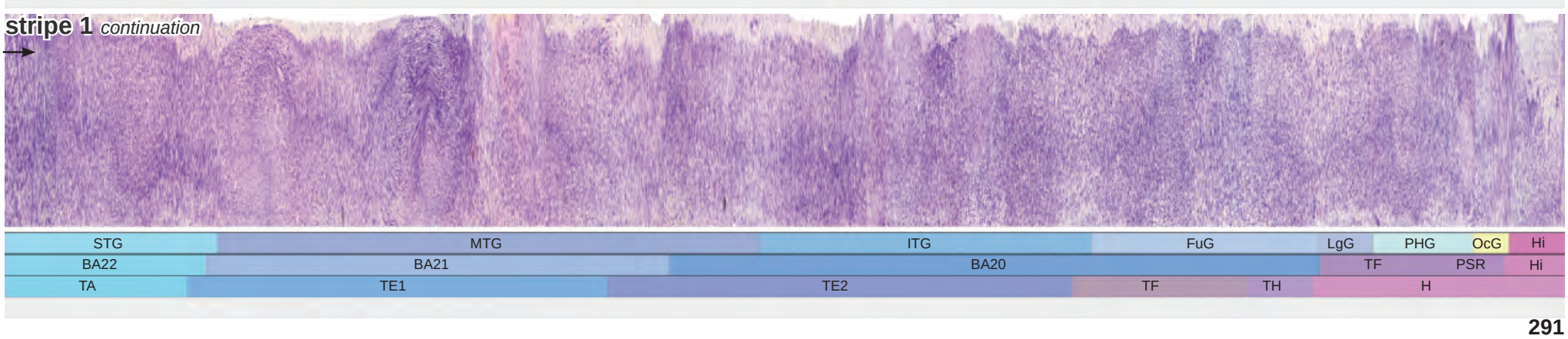
Cell stain (Nissl):
Section Nr. 63
Slice Nr. 4010

TF Area fusiformis.

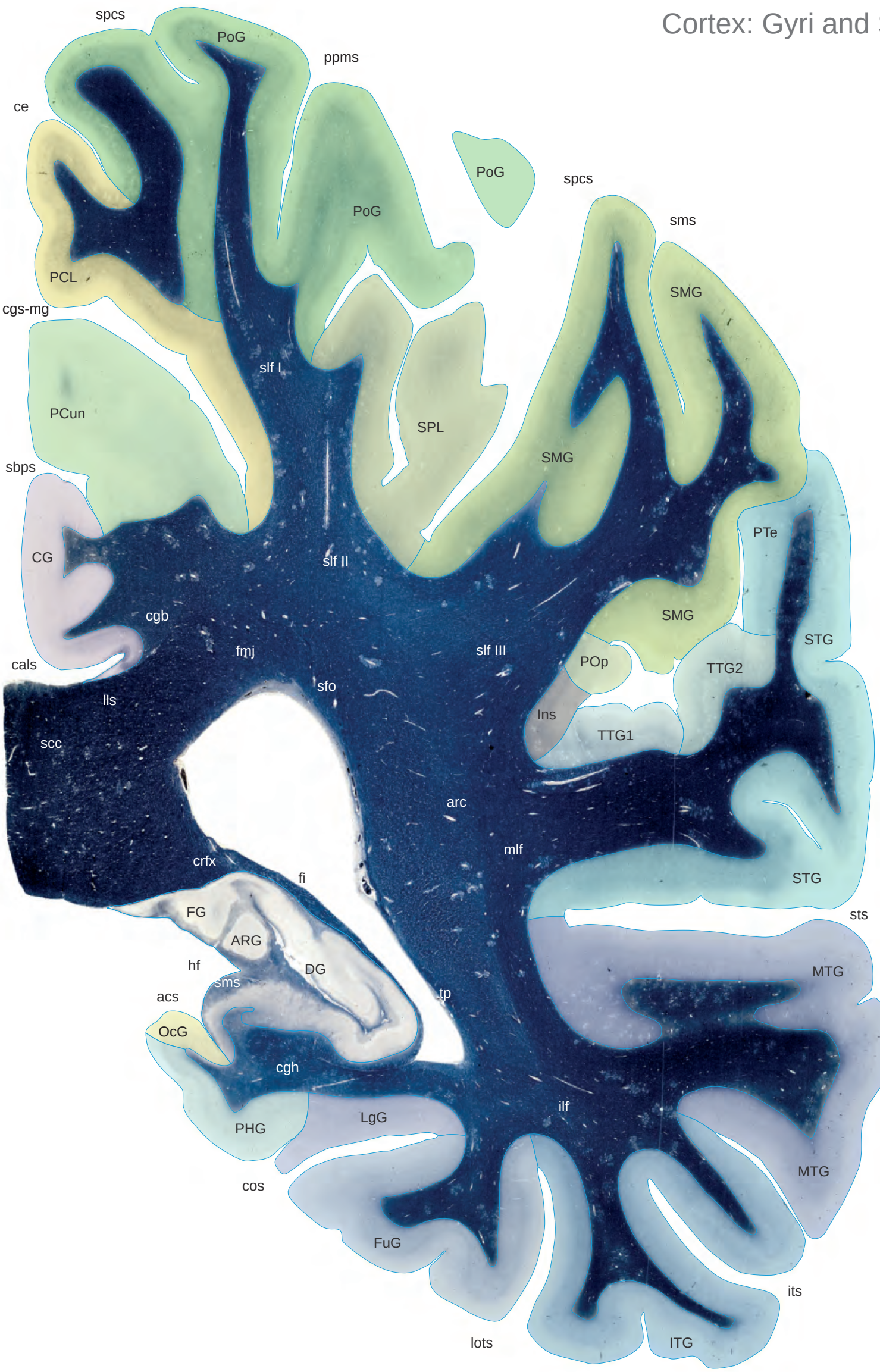
von Economo and Koskinas (1925) Plate XCVI (96)

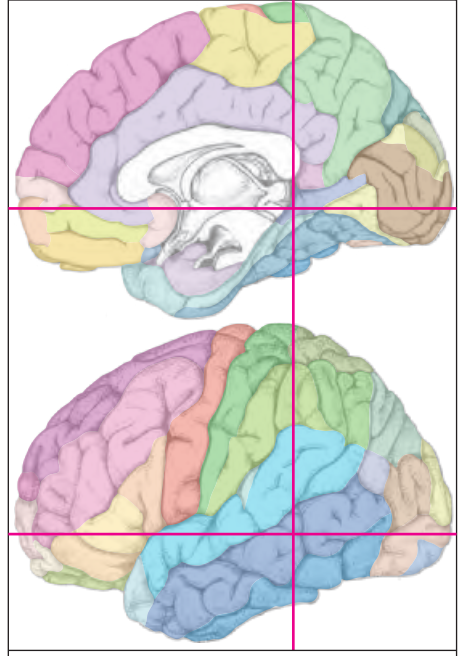






Cortex: Gyri and Sulci





MNI Position y = -43.66 mm
AHB Position y = 41.57 mm

Gyri

ARG Andreas Retzii gyrus
CG cingulate gyrus
DG dentate gyrus
FG fasciolar gyrus
FuG fusiform gyrus
Ins insula
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
ce central sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
hf hippocampal fissure
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sbps subpavrietal sulcus
sms supramarginal sulcus
sts superior temporal sulcus

Fibers

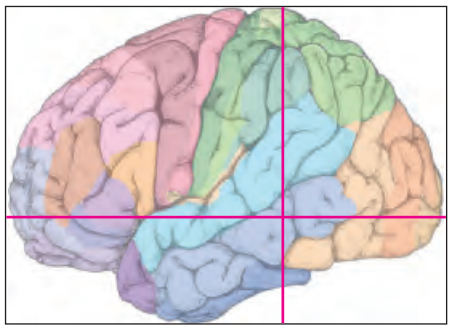
arc arcuate fascicle
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
fi fimbria of the hippocampus
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
mlf middle longitudinal fascicle
scc splenium of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sms superficial medullary stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 64
Slice Nr. 4041

Cortex: Brodmann Areas

64

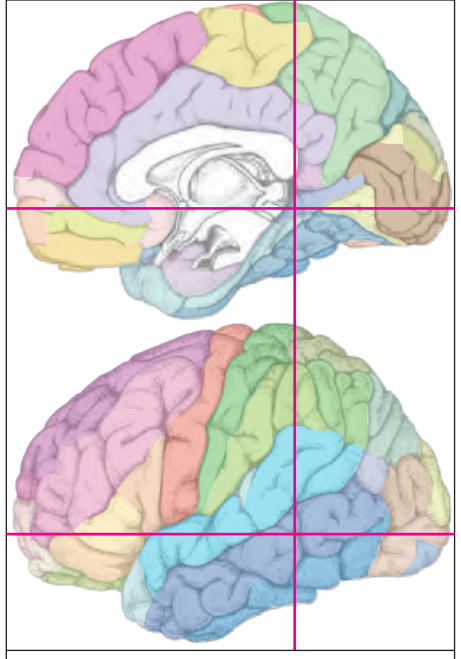
MNI: -43.66
ICL: 41.57
MCP: 26.83



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
alv alveus of the hippocampus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
DG dentate gyrus
hf hippocampal fissure
IGr indusium griseum
its inferior temporal sulcus
lls lateral longitudinal stria
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
PrS presubiculum
PSR perisplenial region
S subiculum
sbps subparietal sulcus
scc splenium of corpus callosum
sms spramarginal sulcus
spcs superior postcentral sulcus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle

Cortex: Gyri and Sulci



MNI Position y = -45.04 mm
AHB Position y = 42.88 mm

Gyri

ARG Andreas Retzii gyrus
CG cingulate gyrus
FuG fusiform gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
ce central sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sbps subpavrietal sulcus
sts superior temporal sulcus

Fibers

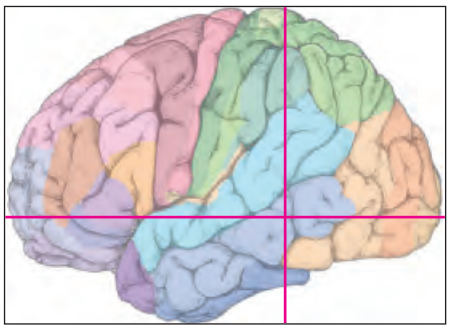
alv alveus of the hippocampus
arc arcuate fascicle
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
mlf middle longitudinal fascicle
mls medial longitudinal stria
scc splenium of corpus callosum
sfo superior fronto-occipital fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
tp tapetum

Fiber stain (Weigert)
Section Nr. 65
Slice Nr. 4090

Cortex: Brodmann Areas

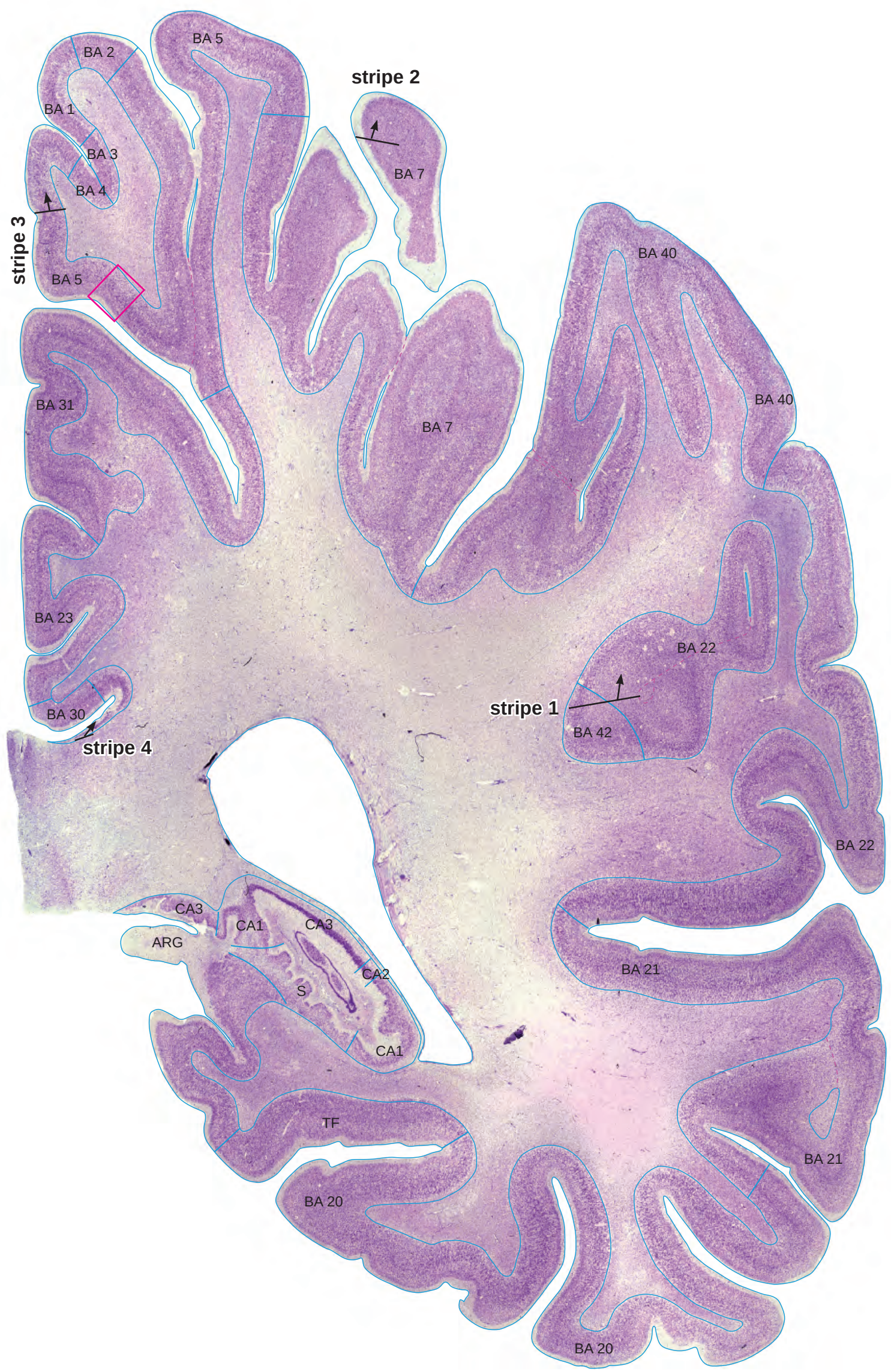
65

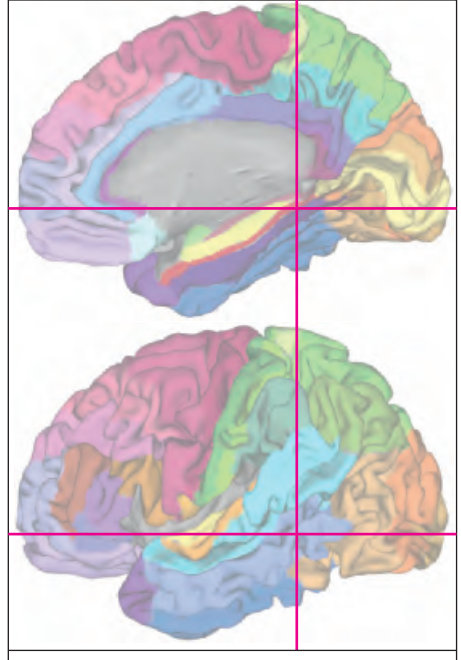
MNI: -45.04
ICL: 42.88
MCP: 28.14



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
alv alveus of the hippocampus
ARG Andreas Retzii gyrus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
IGr indusium griseum
its inferior temporal sulcus
lls lateral longitudinal stria
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
PSR perisplenial region
S subiculum
sbps subparietal sulcus
scc splenium of corpus callosum
sms spramarginal sulcus
spcs superior postcentral sulcus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle





MNI Position y = -45.07 mm
AHB Position y = 42.91 mm

Gyral Pattern

ARG Andreas Retzii gyrus
CG cingulate gyrus
FuG fusiform gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA1 area postcentralis intermedia
BA2 area postcentralis caudalis
BA3 area postcentralis oralis
BA4 area gigantopyramidalis
BA5 area praeparietalis
BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA40 area supramarginalis
BA42 area temporalis transversa externa (posterior)
Hi hippocampus
TF fusiform area

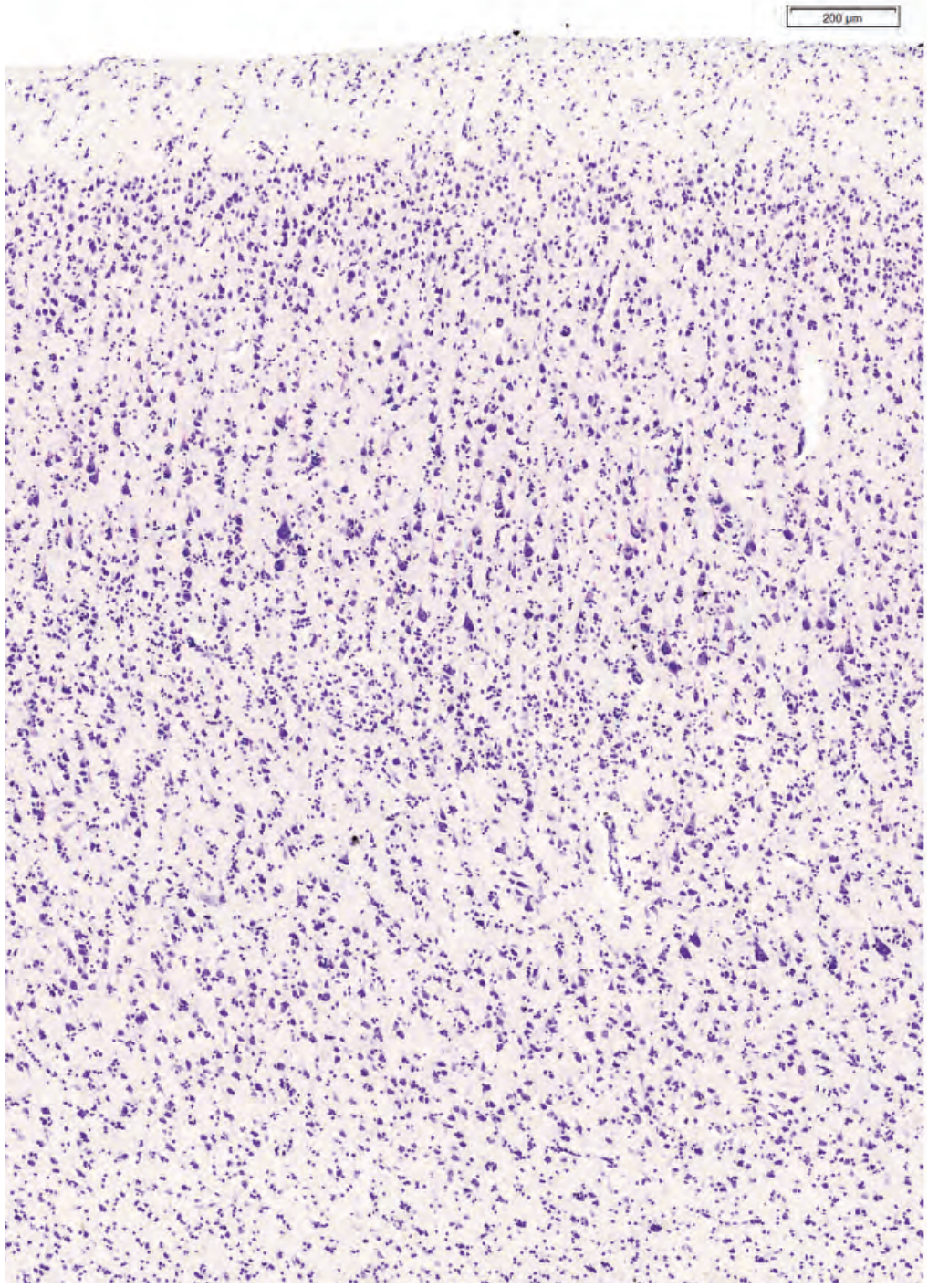
von Economo and Koskinas

FA precentral area
FB agranular frontal area
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
TA superior temporal area
TB magnocellular supratemporal area simplex
TD intercalated supratemporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

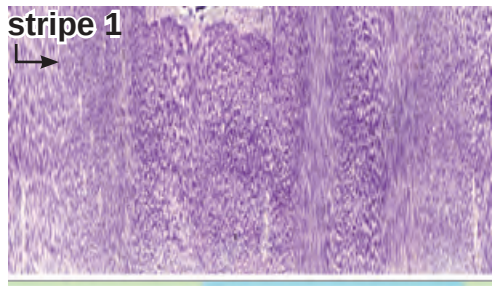
B. Vogt:
23c subregion of BA 23
23d dorsal division of BA 23
29/30 BA 29 and BA30

Cell stain (Nissl):
Section Nr. 65
Slice Nr. 4091

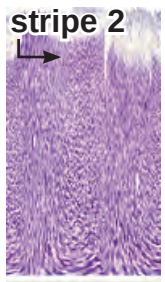


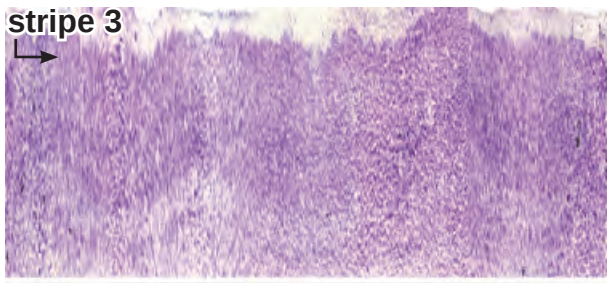
PA(2) Area post-(para-)centralis gigantopyramidalis.

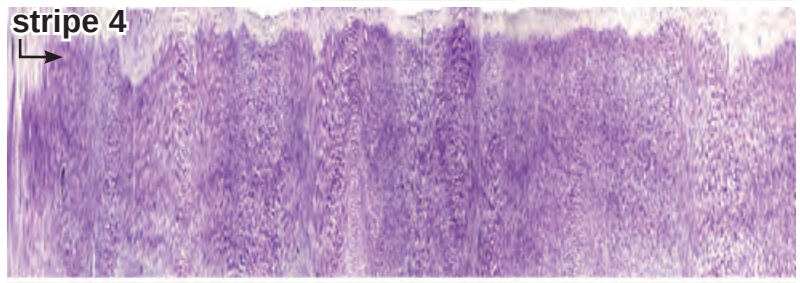
von Economo and Koskinas (1925) Plate LXVII (67)



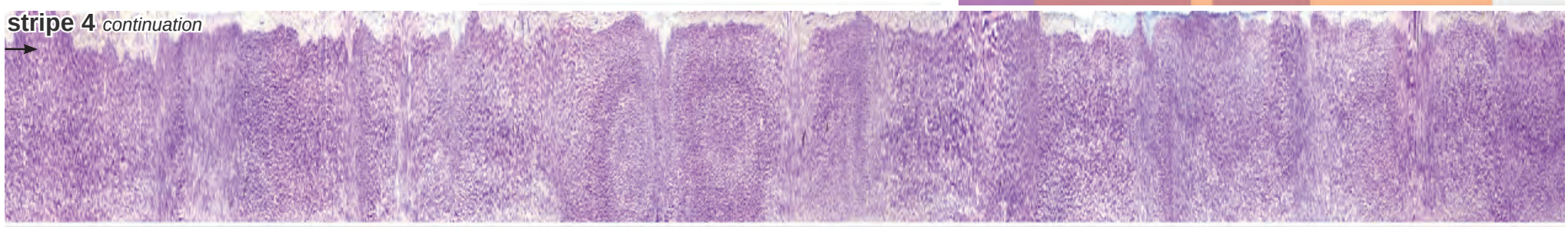
Gyral pattern	POp	PTe	POp
Brodmann areas	BA22	BA42	BA22
von Economo	TD	TA	TB TD
Regions of Interest			



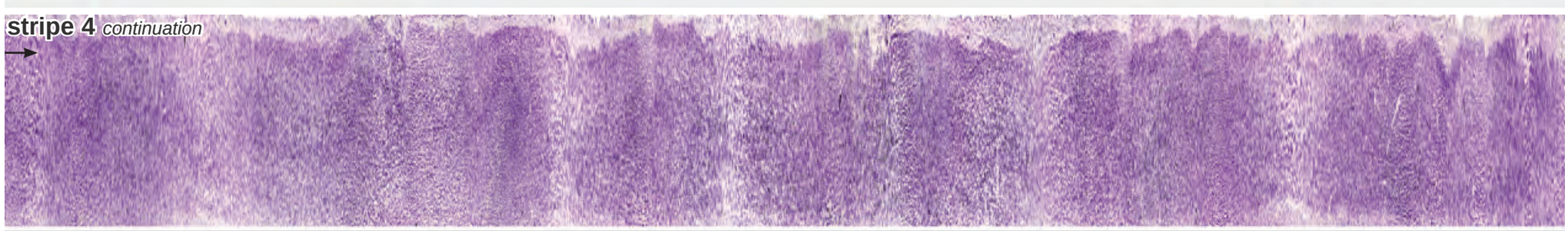




Gyral pattern	SPL	PCL	PoG	PCL	CG	PCun	SPL
Brodmann areas	BA7	BA5 BA4 BA3 BA1 BA2	BA5		BA30	BA23	BA31
von Economo	PE	PA	PB	PA FA PA	LC2-3	LC1	PE FB PA
Regions of Interest					29/30	23d 23c 23d	23c

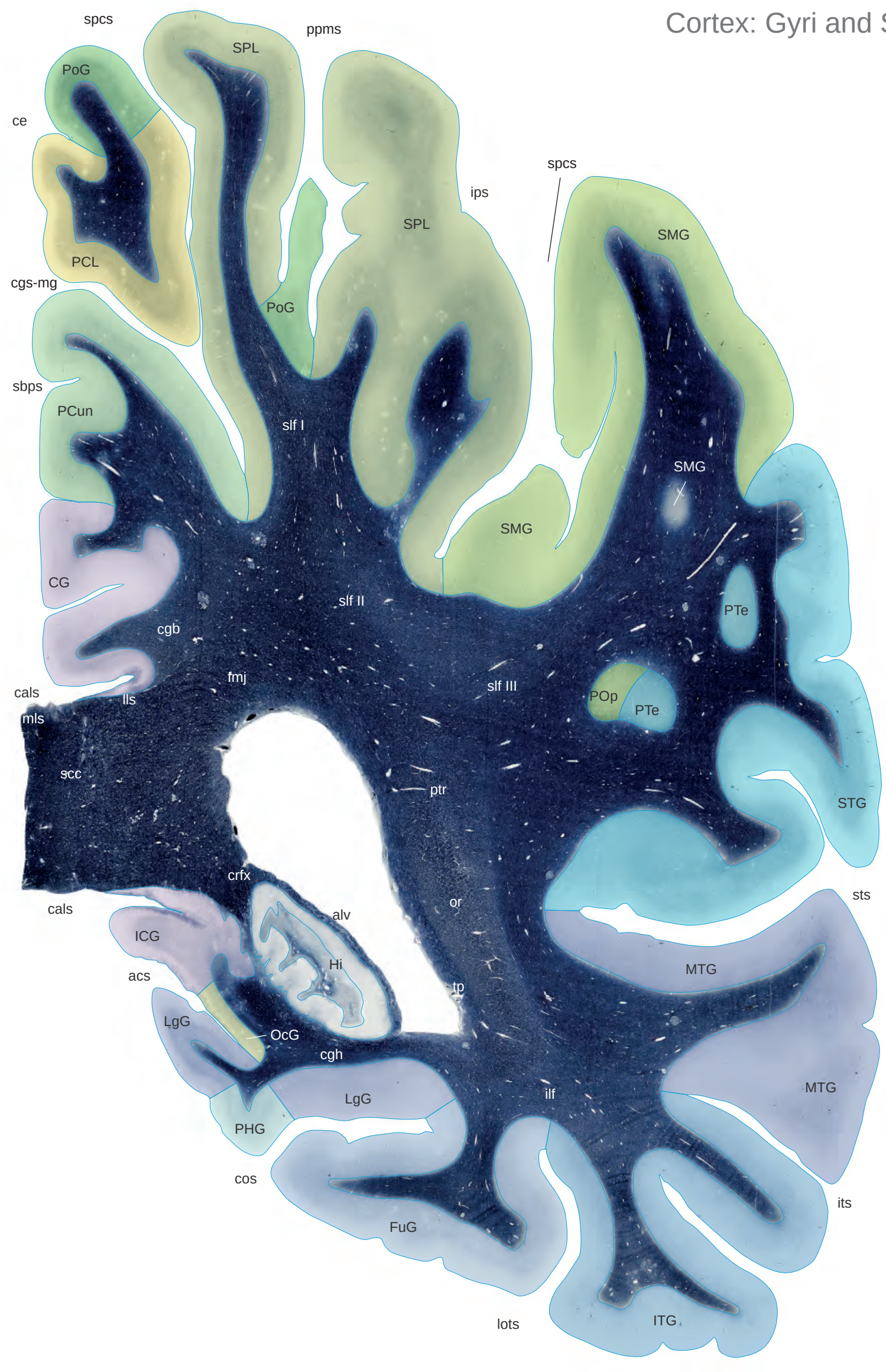


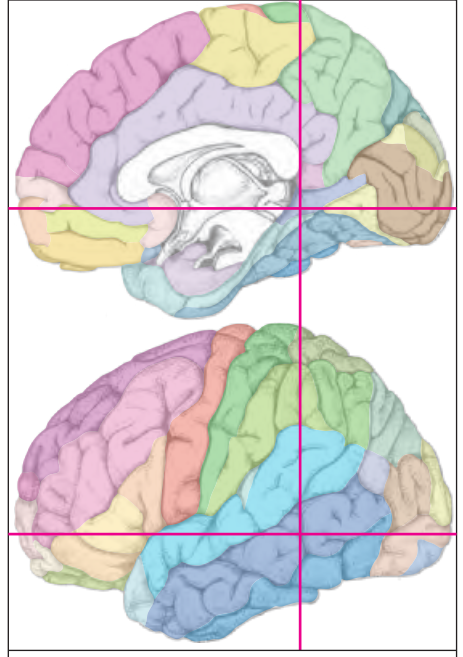
SPL	PoG	SPL		SMG	STG
BA31 BA5		BA7		BA40	BA22
PA	PB	PC	PE	PF	TA



STG	MTG	ITG		FuG		LgG	PHG LgG OcG	Hi
BA22	BA21	BA20				TF		Hi
TA	TE1	TE2		TF	TH	H		

Cortex: Gyri and Sulci





MNI Position y = -46.42 mm
AHB Position y = 44.20 mm

Gyri

CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
POp parietal operculum
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
ce central sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sbps subpavrietal sulcus
sts superior temporal sulcus

Fibers

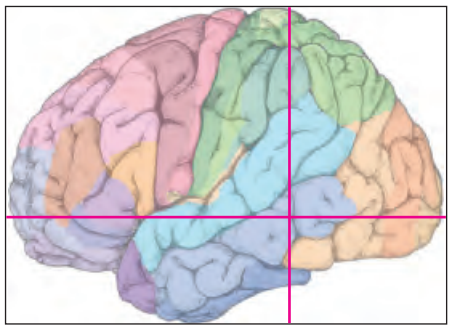
alv alveus of the hippocampus
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
or optic radiation
ptr posterior thalamic radiation
scc splenium of corpus callosum
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
tp tapetum

Fiber stain (Weigert)
Section Nr. 66
Slice Nr. 4139

Cortex: Brodmann Areas

66

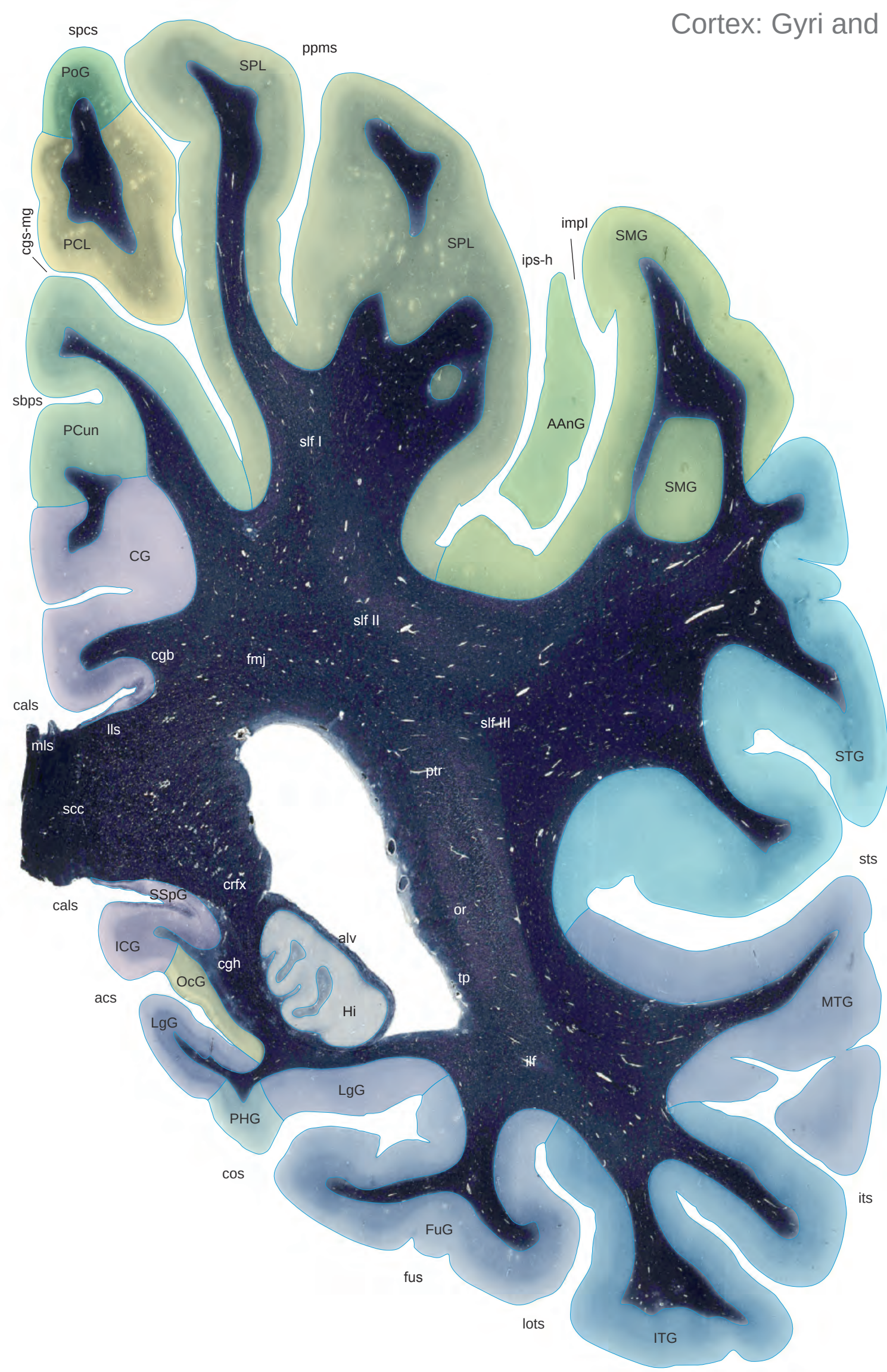
MNI: -46.42
ICL: 44.20
MCP: 29.46

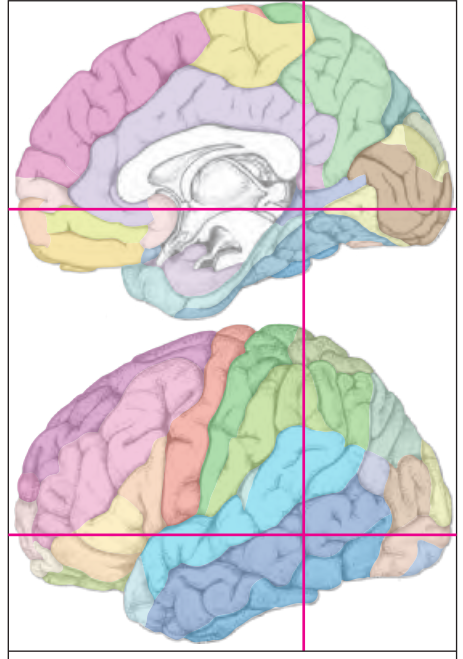


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
CA1 CA1 field of hippocampus
CA2 CA2 field of hippocampus
CA3 CA3 field of hippocampus
ce central sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
DG dentate gyrus
IGr indusium griseum
its inferior temporal sulcus
lls lateral longitudinal stria
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
PSR perisplenial region
S subiculum
sbps subparietal sulcus
scc splenium of corpus callosum
spcs superior postcentral sulcus
SSpG subsplenial gyrus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle

Cortex: Gyri and Sulci





MNI Position y = -47.89 mm
AHB Position y = 45.59 mm

Gyri

AAnG anterior angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
SSpG subsplenial gyrus
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fus midfusiform sulcus
impl anterior intermediate parietal sulcus (Jensen)
ips-h intraparietal sulcus, horizontal part
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sbps subparietal sulcus
sts superior temporal sulcus

Fibers

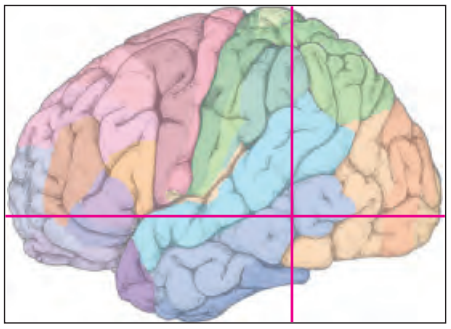
alv alveus of the hippocampus
cgb cingulum bundle
cgh cingulum (hippocampal part)
crfx crus of fornix
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
lls lateral longitudinal stria
mls medial longitudinal stria
or optic radiation
ptr posterior thalamic radiation
scc splenium of corpus callosum
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
tp tapetum

Fiber stain (Weigert)
Section Nr. 67
Slice Nr. 4191

Cortex: Brodmann Areas

67

MNI: -47.89
ICL: 45.59
MCP: 30.85



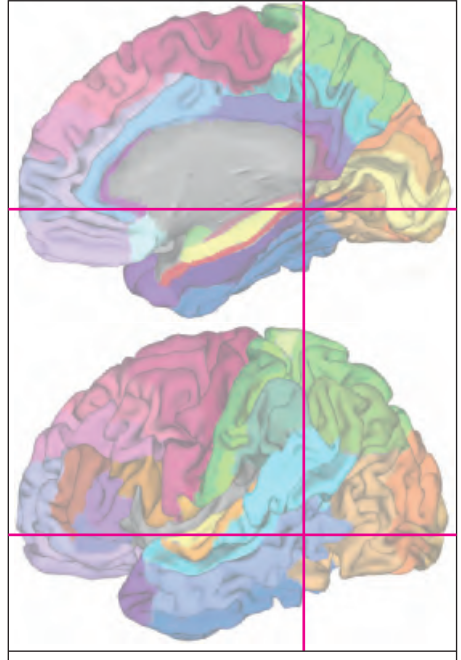
BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
CA1 CA1 field of hippocampus
CA3 CA3 field of hippocampus
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
fus midfusiform sulcus
IGr indusium griseum
impl anterior intermediate parietal sulcus of Jensen
ips intraparietal sulcus
isst internal sagittal stratum
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ls longitudinal stria
or optic radiation
ppms posterior paramidline sulcus
racc radiation of corpus callosum
PSR perisplenial region
RSC retrosplenial cortex
S subiculum
sbps subparietal sulcus
scc splenium of corpus callosum
spcs superior postcentral sulcus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle

stripe 1

stripe 2

BA 5
BA 2
BA 5
BA 7
BA 7
BA 40
BA 31
BA 31
BA 39
BA 22
BA 23
BA 40
BA 30
BA 22
S
CA3
RSC
CA1
BA 21
BA 36
BA 21
BA 37
BA 20
BA 20



MNI Position y = -47.91 mm
AHB Position y = 45.62 mm

Gyral Pattern

AAnG anterior angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
SSpG subsplenial gyrus
STG superior temporal gyrus

Brodmann Areas

BA2 area postcentralis caudalis
BA5 area praeparietalis
BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA40 area supramarginalis
Hi hippocampus

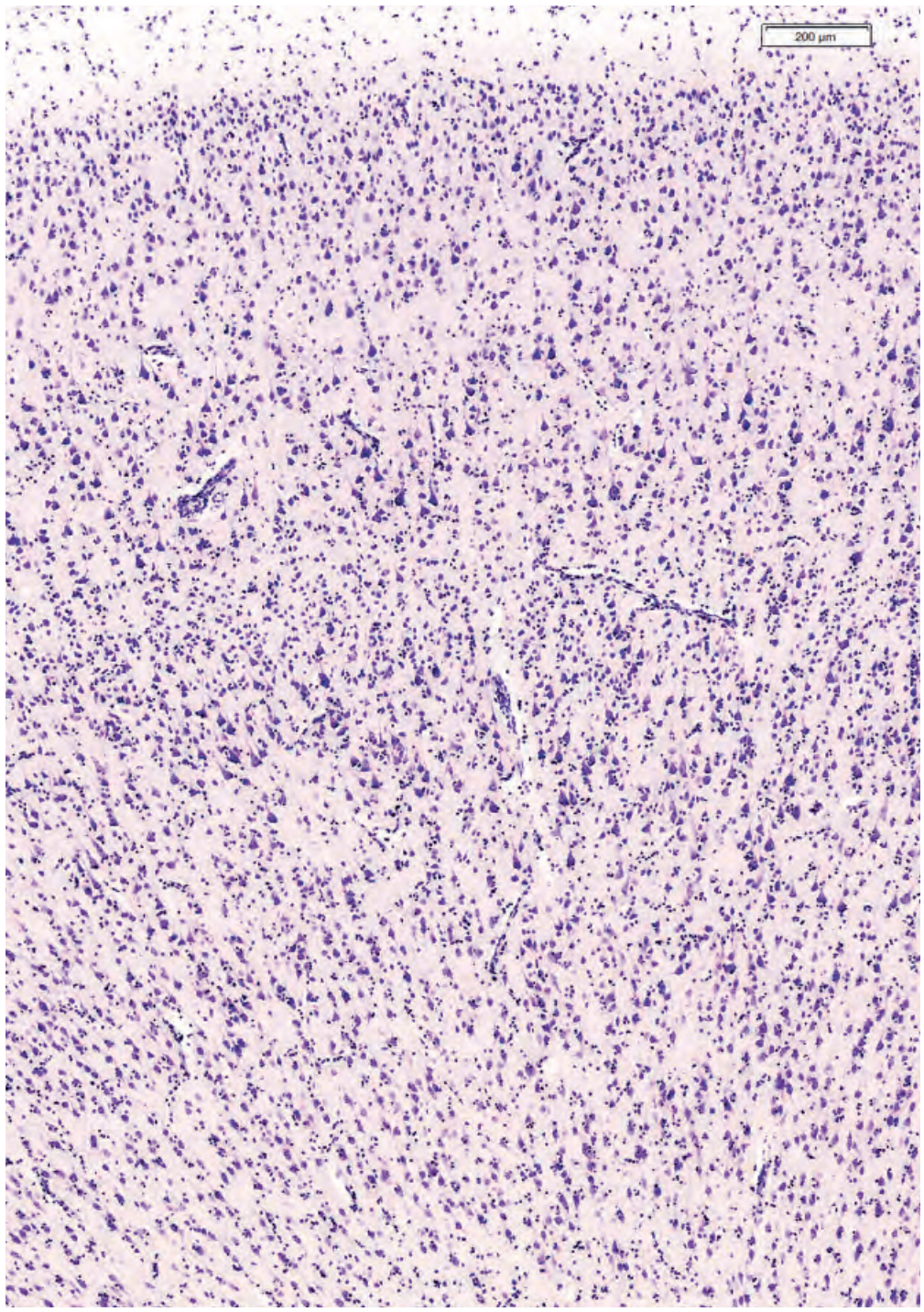
von Economo and Koskinas

FB agranular frontal area
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

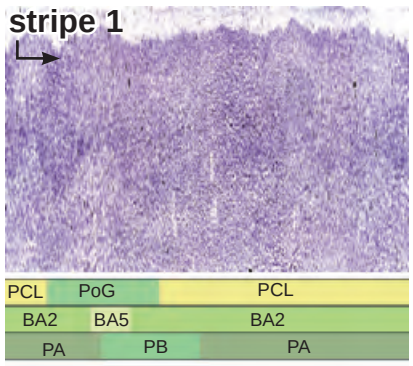
B. Vogt:
23d dorsal division of BA 23
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31

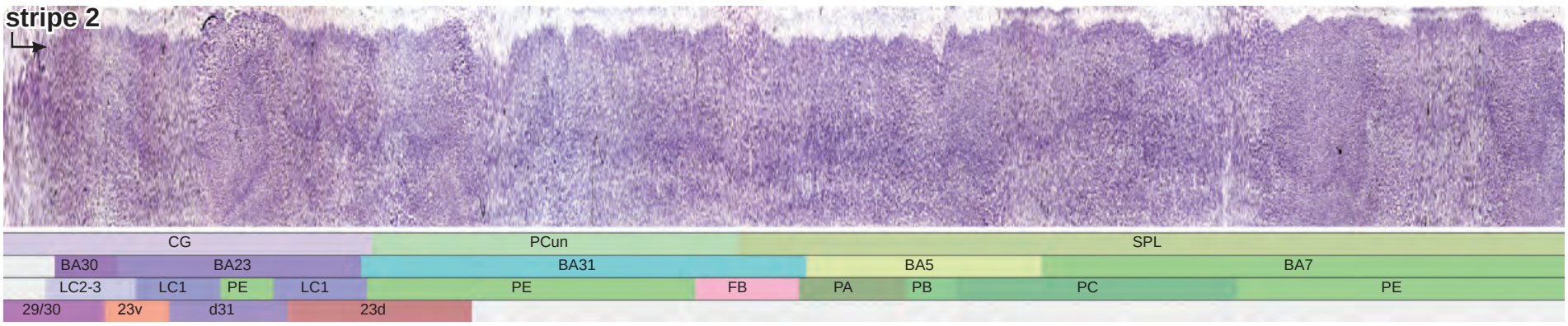
Cell stain (Nissl):
Section Nr. 67
Slice Nr. 4192

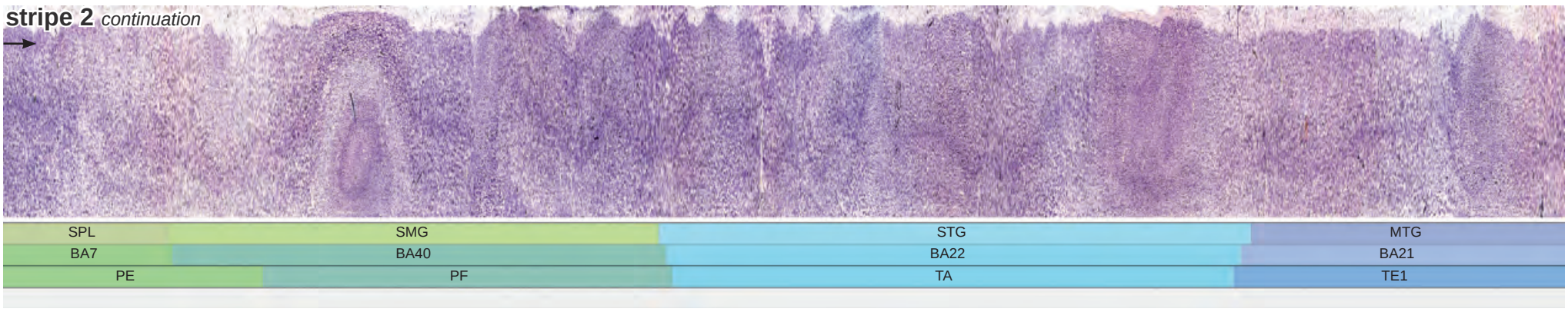


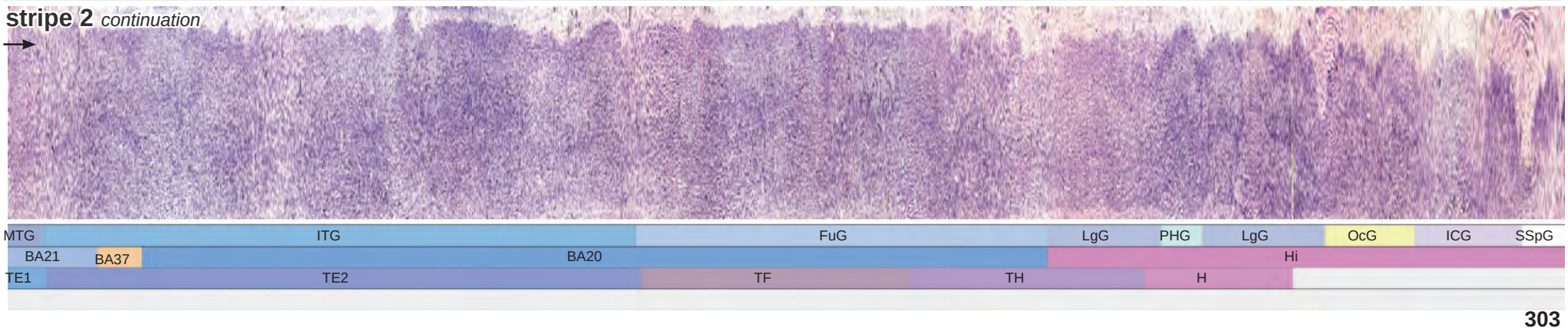
LC2 Area cingularis posterior ventralis.

von Economo and Koskinas (1925) Plate XLIX (49)

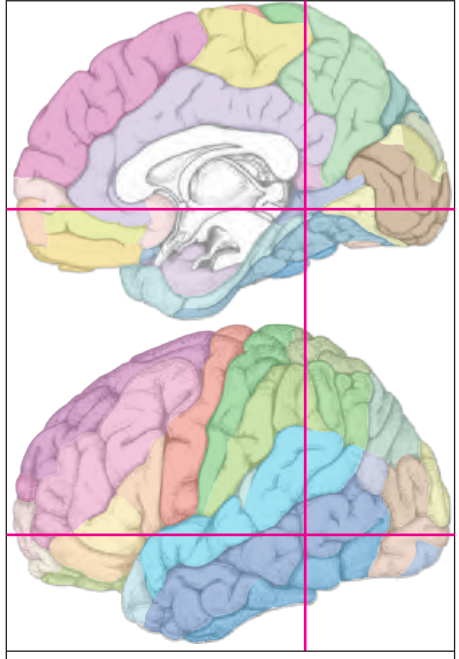








Cortex: Gyri and Sulci



MNI Position y = -49.29 mm
AHB Position y = 46.93 mm

spcs
ppms
SPL
PoG
SPL
ips-h
impl
PCL
SMG
cgs-mg
SPL
AAnG
SMG
sbps
slf I
PCun
AAnG
CG
slf II
cgb
fmj
ptr
slf III
STG
cals
mls
scc
sstr
SSpG
sts
cals
ICG
or
cgh
MTG
alv
tp
MTG
Hi
acs
LgG
OcG
ilf
LgG
PHG
MTG
its
cos
FuG
fus
lots
ITG

Gyri

AAnG anterior angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyrus
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
SSpG subsplenial gyrus
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fus midfusiform sulcus
impl anterior intermediate parietal sulcus (Jensen)
ips-h intraparietal sulcus, horizontal part
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
spcs superior postcentral sulcus
ppms parietal paramidline sulcus
sbps subparietal sulcus
sts superior temporal sulcus

Fibers

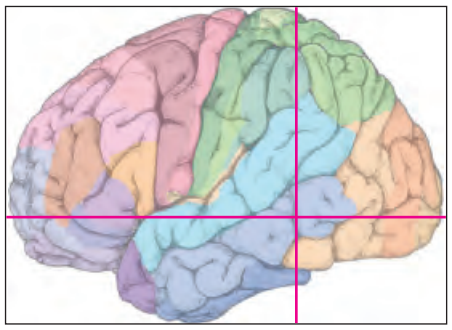
alv alveus of the hippocampus
cgb cingulum bundle
cgh cingulum (hippocampal part)
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
mls medial longitudinal stria
or optic radiation
ptr posterior thalamic radiation
scc splenium of corpus callosum
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 68
Slice Nr. 4241

Cortex: Brodmann Areas

68

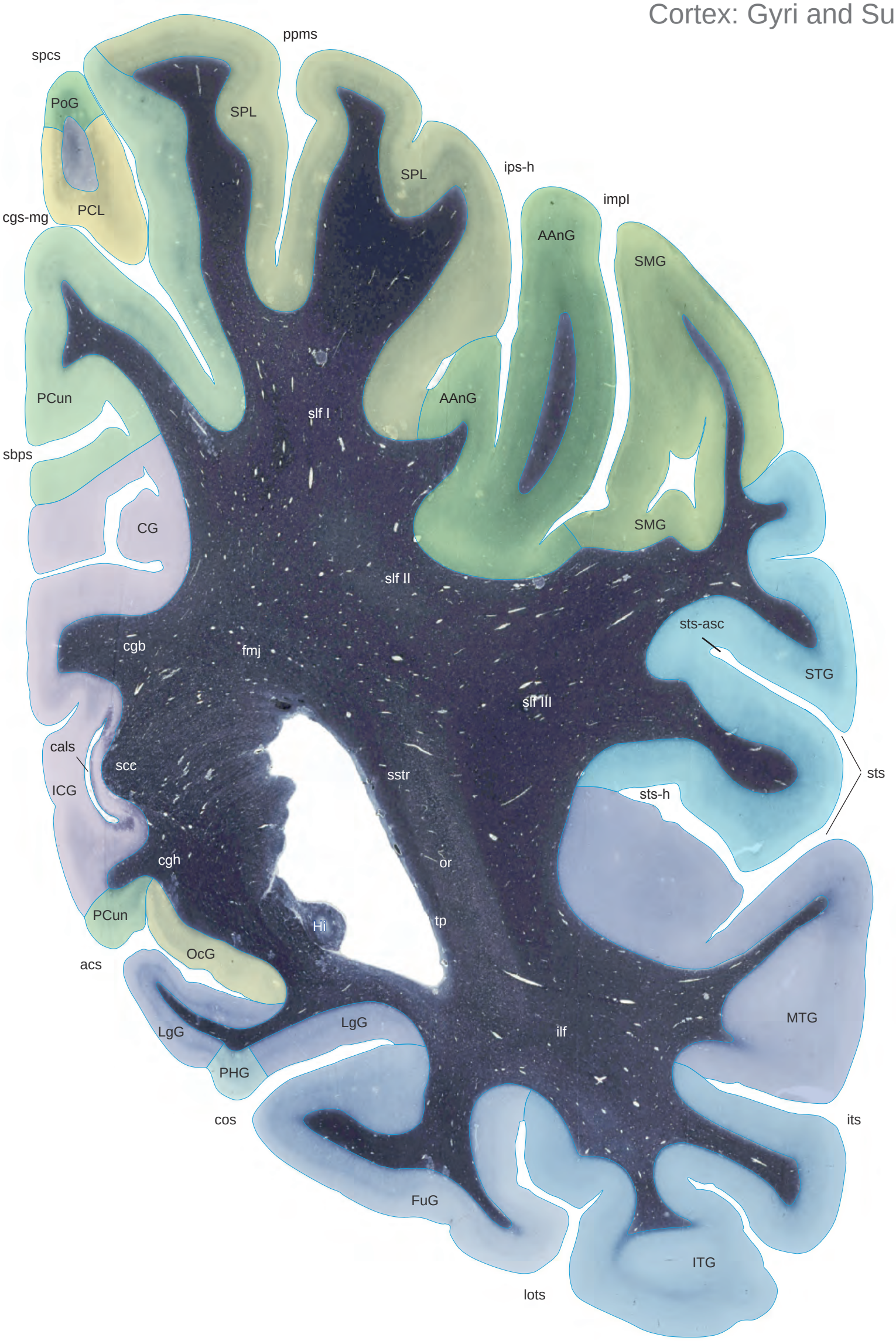
MNI: -49.29
ICL: 46.93
MCP: 32.19

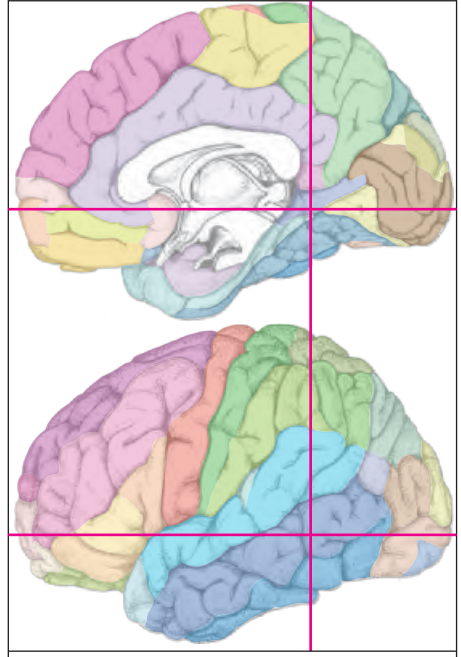


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
CA1 CA1 field of hippocampus
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
impl anterior intermediate parietal sulcus of Jensen
ips-h intraparietal sulcus, horizontal segment
isst internal sagittal stratum
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
mfs midfusiform sulcus
or optic radiation
racc radiation of corpus callosum
PSR perisplenial region
sbps subparietal sulcus
scc splenium of corpus callosum
spcs superior postcentral sulcus
SSpG subsplenial gyrus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle

Cortex: Gyri and Sulci





MNI Position y = -50.70 mm
AHB Position y = 48.27 mm

Gyri

AAnG angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
impl anterior intermediate parietal sulcus (Jensen)
ips-h intraparietal sulcus, horizontal part
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
sbps subparietal sulcus
ppms parietal paramidline sulcus
spcs superior postcentral sulcus
sts superior temporal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

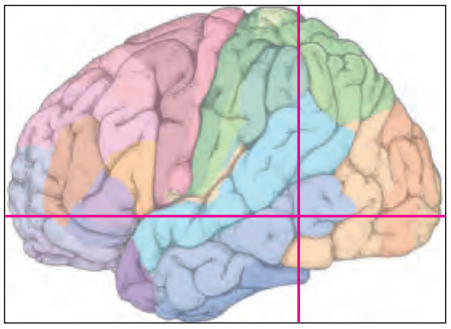
cgb cingulum bundle
cgh cingulum (hippocampal part)
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
or optic radiation
scc splenium of corpus callosum
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 69
Slice Nr. 4291

Cortex: Brodmann Areas

69

MNI: -50.70
ICL: 48.27
MCP: 33.53



BA1-52 Brodmann areas 1-52 (see p. 101)

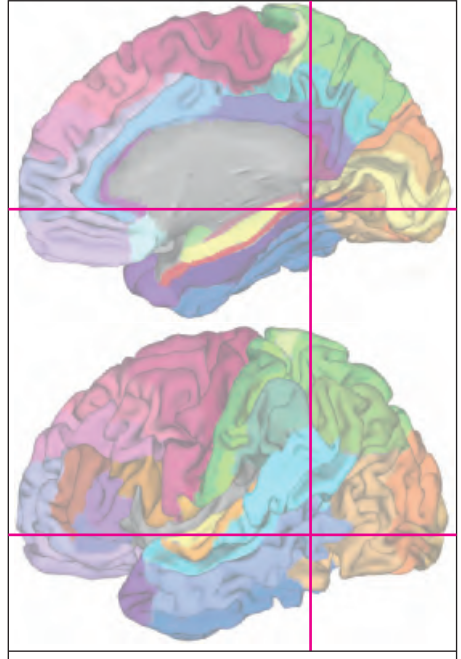
acs anterior calcarine sulcus
CA1 CA1 field of hippocampus
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
impl anterior intermediate parietal sulcus of Jensen
ips-h intraparietal sulcus, horizontal segment
isst internal sagittal stratum
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
or optic radiation
ppms posterior paramidline sulcus
racc radiation of corpus callosum
RSC retrosplenial cortex
S subiculum
sbps subparietal sulcus
scc splenium of corpus callosum
spcs superior postcentral sulcus
sts superior temporal sulcus
tp tapetum
TrLV trigone of lateral ventricle

stripe 2

stripe 1

stripe 3

BA 7
BA 5
BA 7
BA 7
BA 39
BA 40
BA 32
BA 31
BA 7
BA 32
BA 22
BA 23
BA 40
BA 23
BA 30
BA 29
BA 22
BA 26
BA 22
BA 26
BA 29
BA 30
BA 21
CA1
BA 21
BA 36
BA 37
BA 20
BA 20



MNI Position y = -50.67 mm
AHB Position y = 48.24 mm

Gyral Pattern

AAnG angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
Hi hippocampus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
PoG postcentral gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA5 area praeparietalis
BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA26 area ectosplenialis
BA29 area retrolimbica granularis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA32 area cingularis anterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis
BA40 area supramarginalis

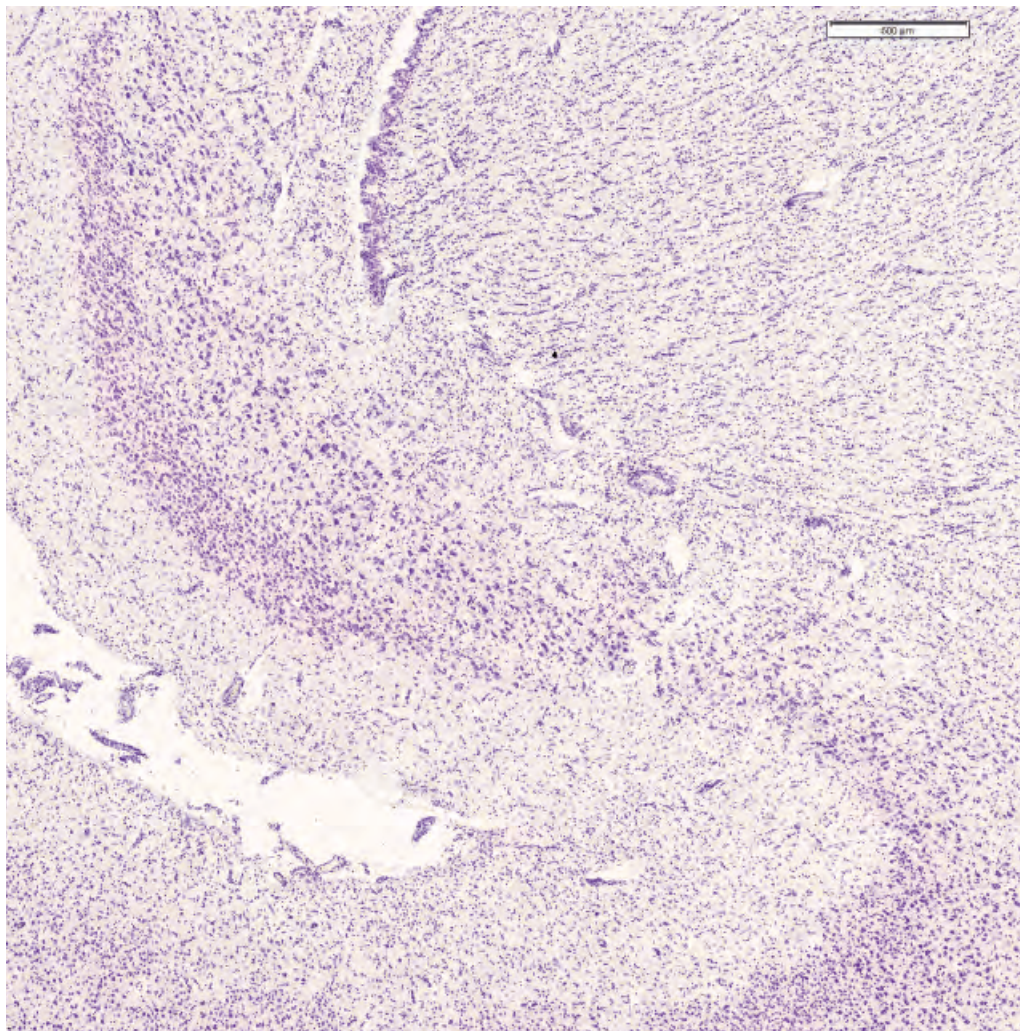
von Economo and Koskinas

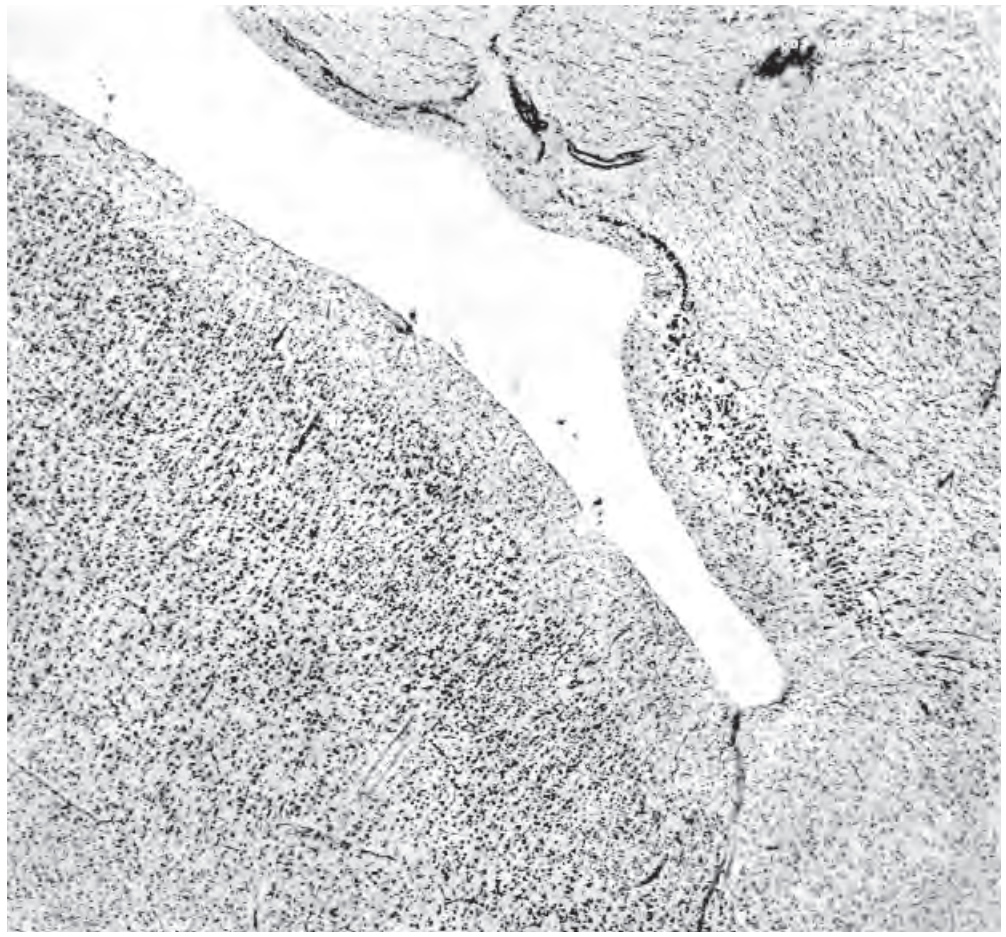
FB agranular frontal area
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PB oral postcentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
PG angular area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

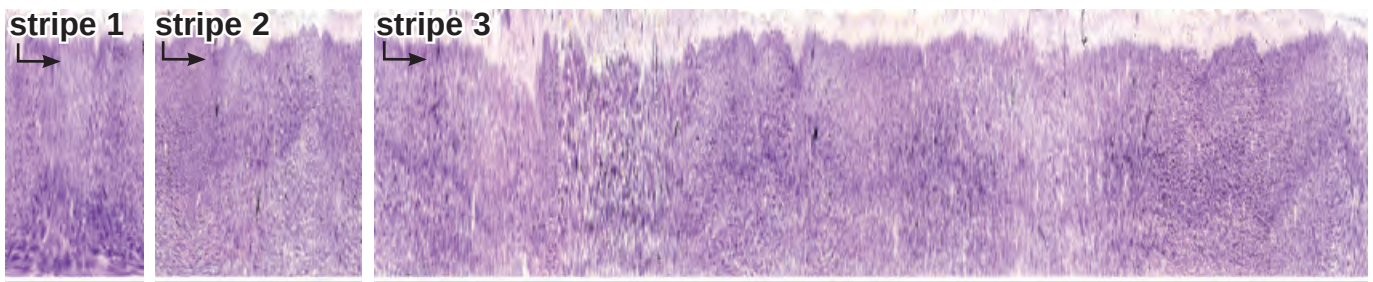
B. Vogt:
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31

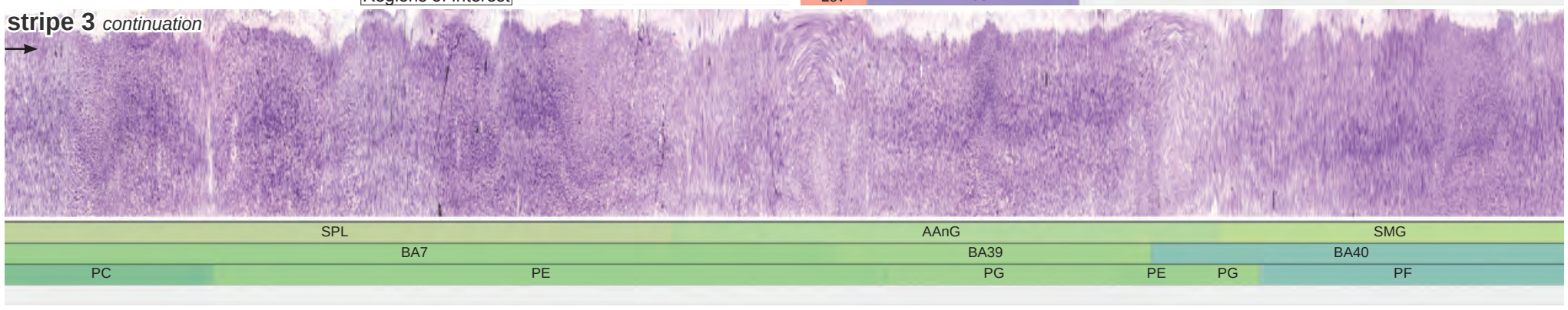
Cell stain (Nissl):
Section Nr. 69
Slice Nr. 4290

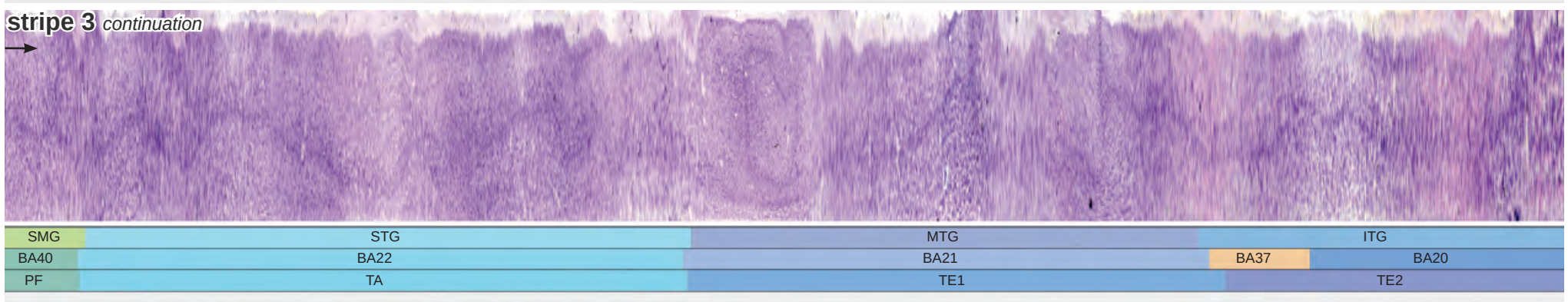


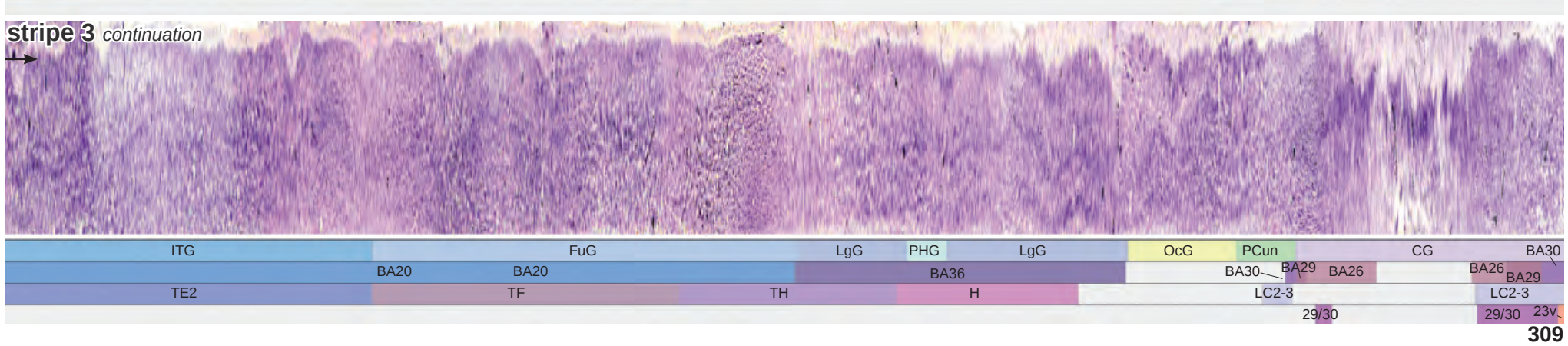


LD Area retrosplenialis agranularis. LE1 Area granulosa retrosplenii superior. LB1 Area ultracingularis anterior. LF1 Area ultracingularis posterior. LF2 Area obtecta. LB2 Area indusei (posterior). von Economo and Koskinas (1925) Plate LI (51)

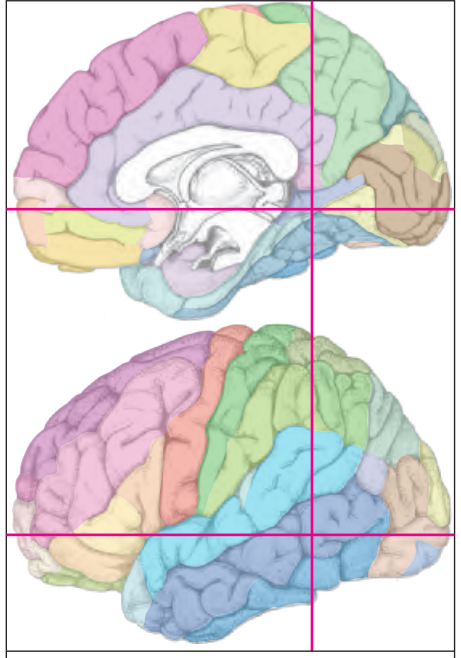







stripe 3 continuation
ITG FuG LgG PHG LgG OcG PCun CG BA30
BA20 BA20 BA36 BA30 BA29 BA26 BA26 BA29
TE2 TF TH H LC2-3 LC2-3
29/30 29/30 23v

Cortex: Gyri and Sulci



MNI Position y = -52.05 mm
AHB Position y = 49.56 mm

Gyri

AAnG angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cals callosal sulcus
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
impl anterior intermediate parietal sulcus (Jensen)
ips-h intraparietal sulcus, horizontal part
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

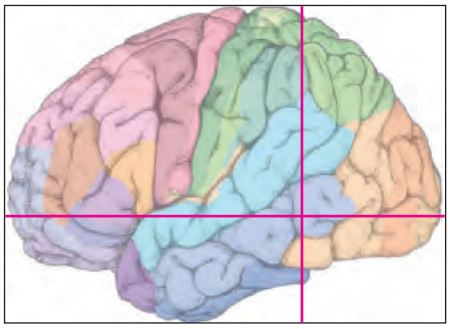
cgb cingulum bundle
cgh cingulum (hippocampal part)
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
or optic radiation
scc splenium of corpus callosum
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 70
Slice Nr. 4339

Cortex: Brodmann Areas

70

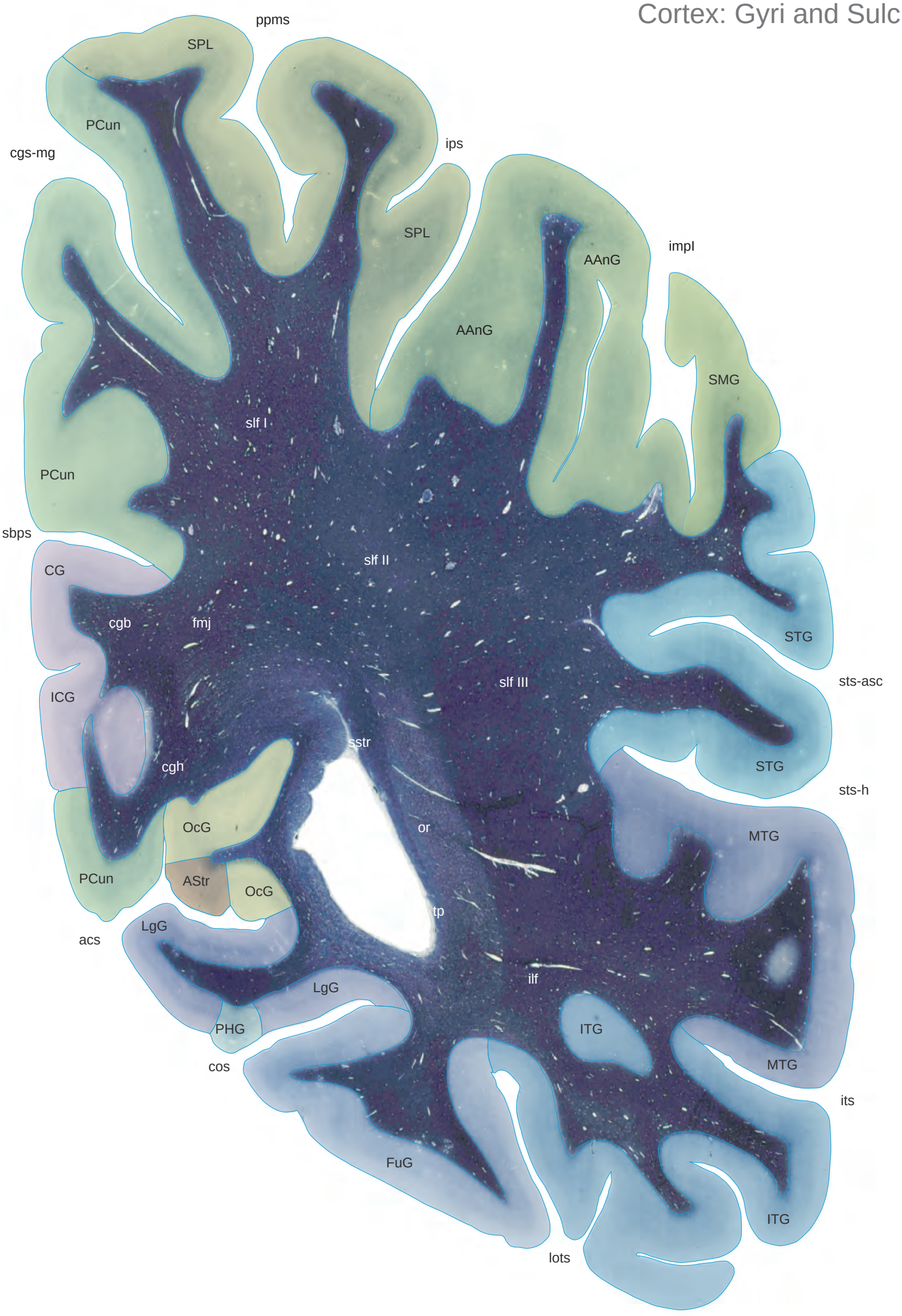
MNI: -52.05
ICL: 49.56
MCP: 34.82

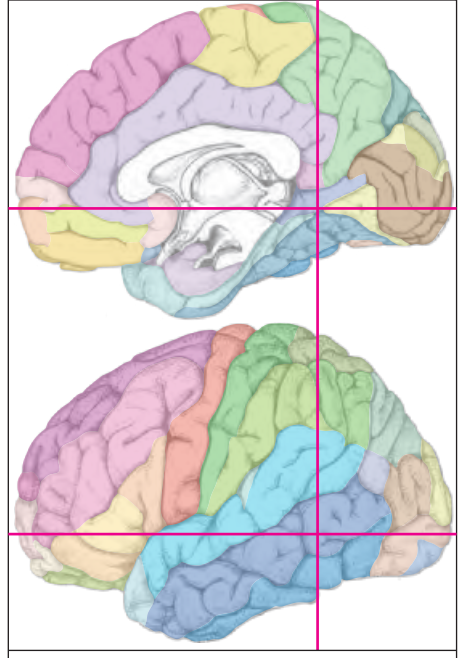


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
impl anterior intermediate parietal sulcus of Jensen
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -53.52 mm
AHB Position y = 50.95 mm

Gyri

AAnG angular gyrus
AStr striate area
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
PHG parahippocampal gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
impl anterior intermediate parietal sulcus (Jensen)
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

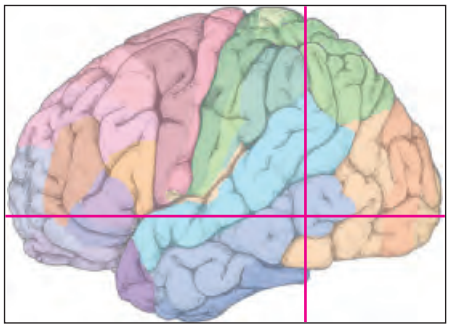
cgb cingulum bundle
cgh cingulum (hippocampal part)
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 71
Slice Nr. 4391

Cortex: Brodmann Areas

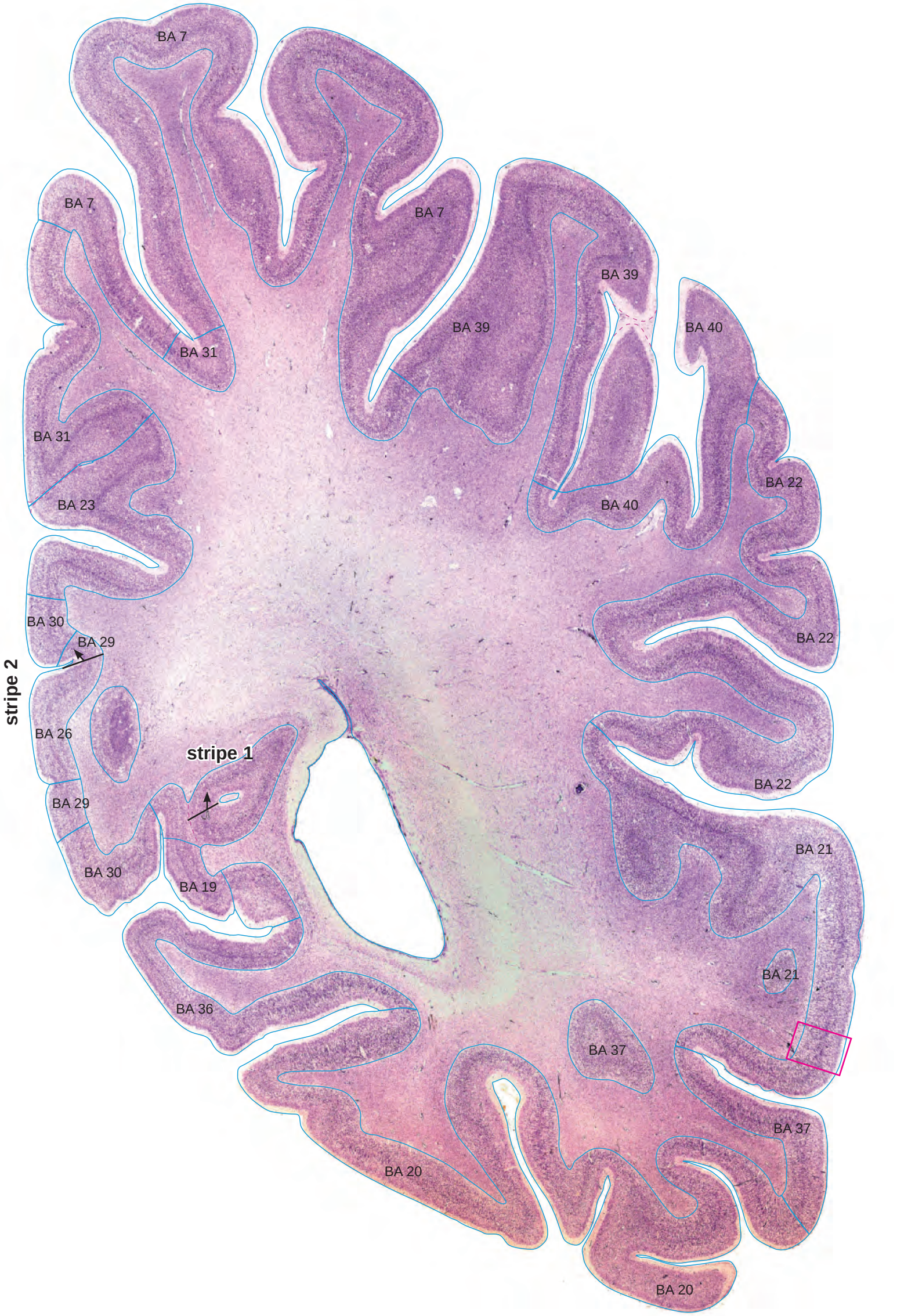
71

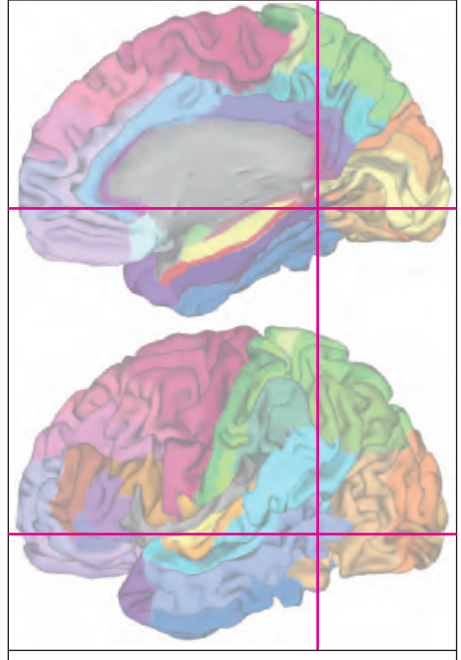
MNI: -53.52
ICL: 50.95
MCP: 36.21



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cal calcar avis
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
impl anterior intermediate parietal sulcus of Jensen
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -53.54 mm
AHB Position y = 50.98 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
PHG parahippocampal gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA7 area parietalis superior
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA26 area ectosplenialis
BA29 area retrolimbica granularis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis
BA40 area supramarginalis

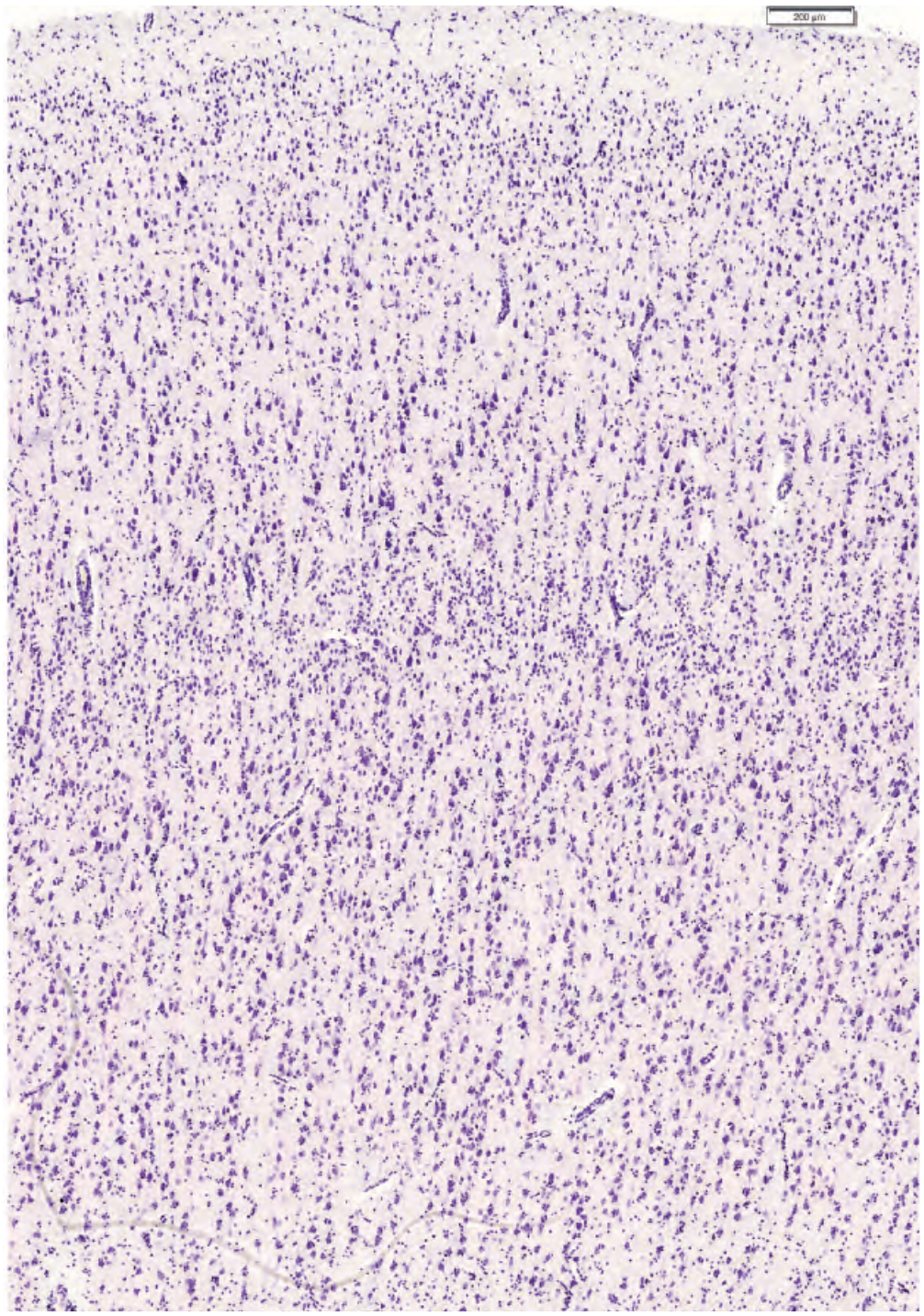
von Economo and Koskinas

H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
PG angular area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

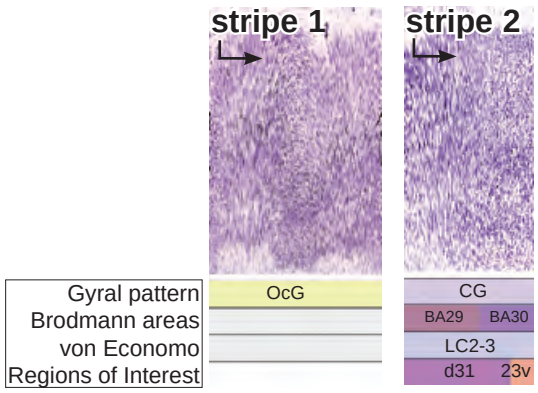
B. Vogt:
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31

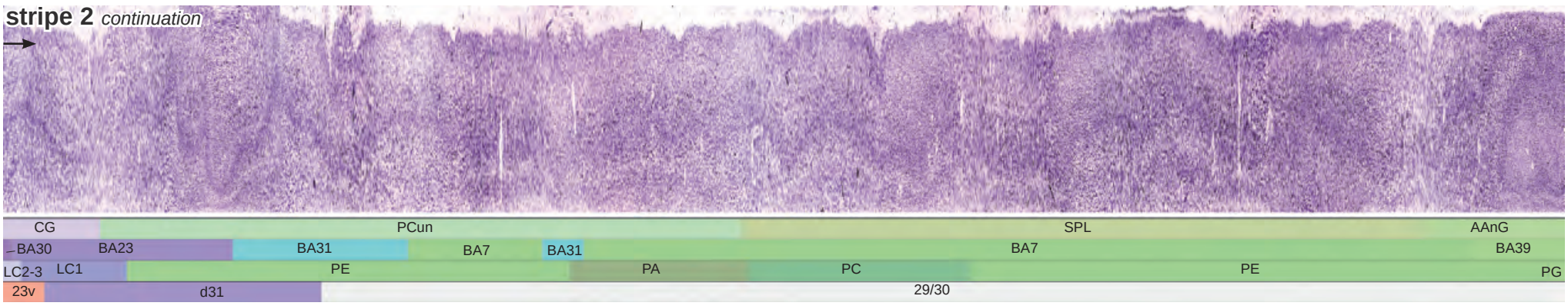
Cell stain (Nissl):
Section Nr. 71
Slice Nr. 4392

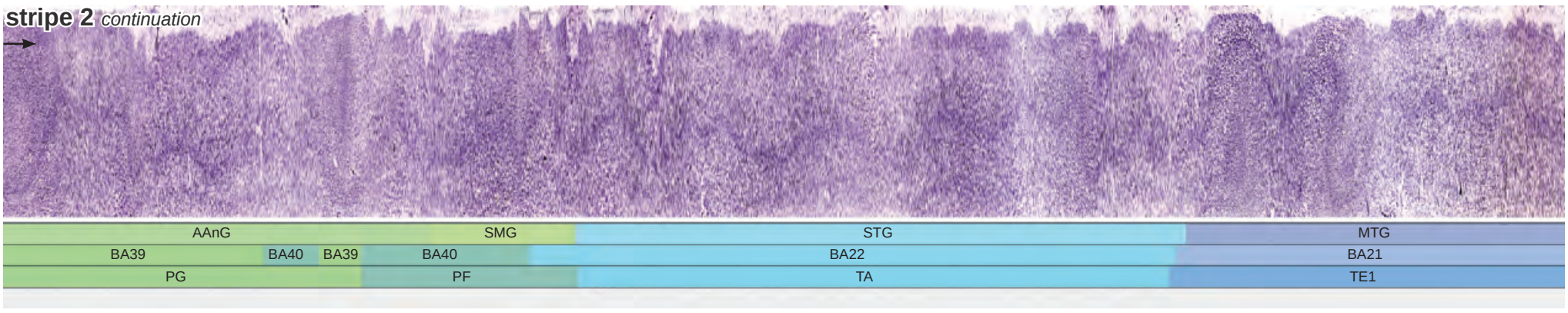


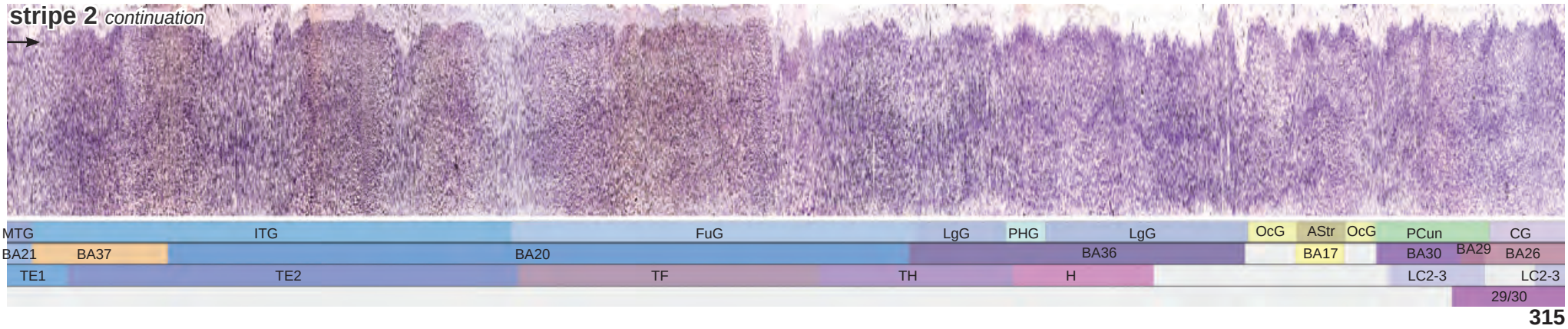
PHT Area parietalis basalis in limine temporali.

von Economo and Koskinas (1925) Plate LXXX (80)

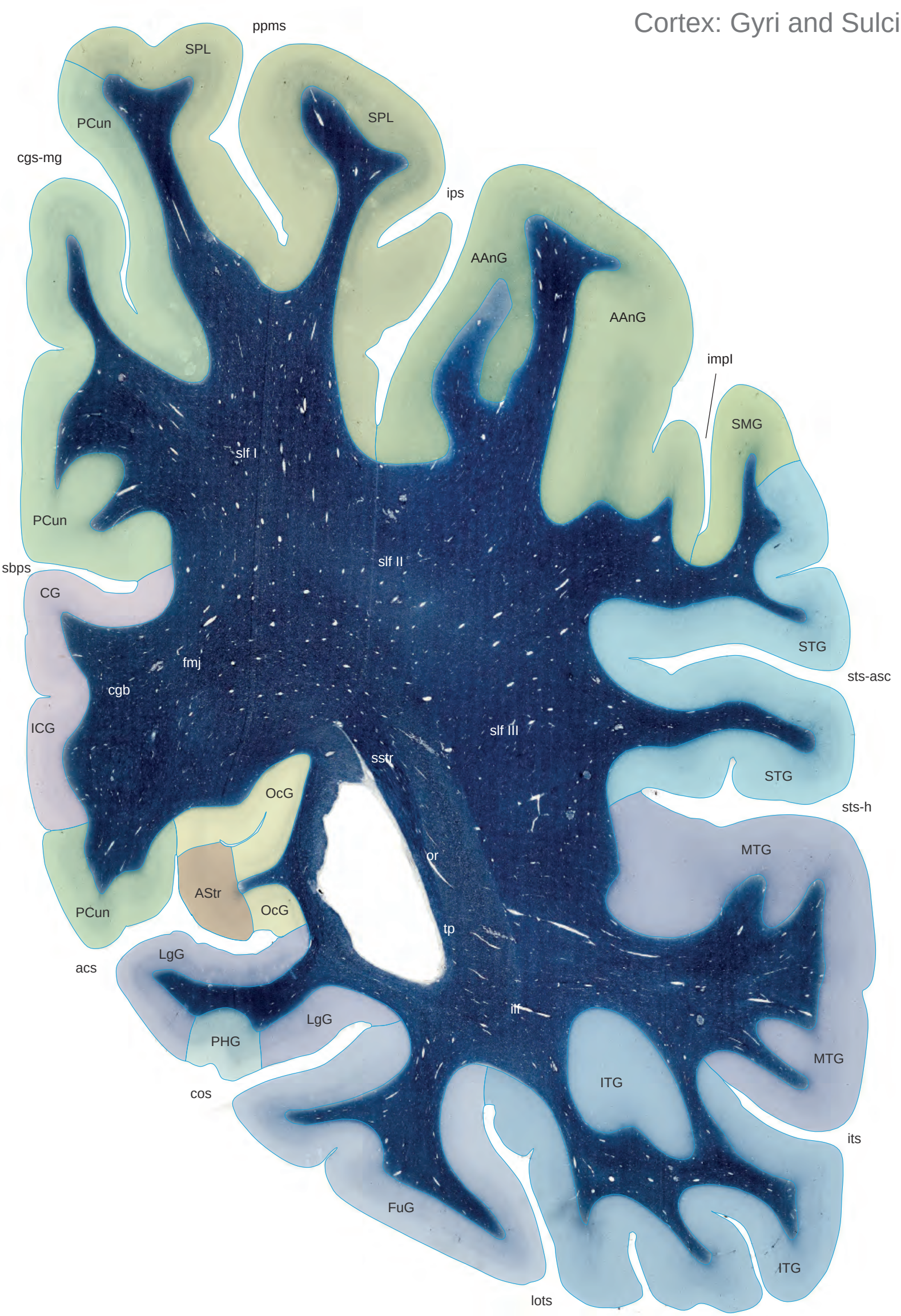


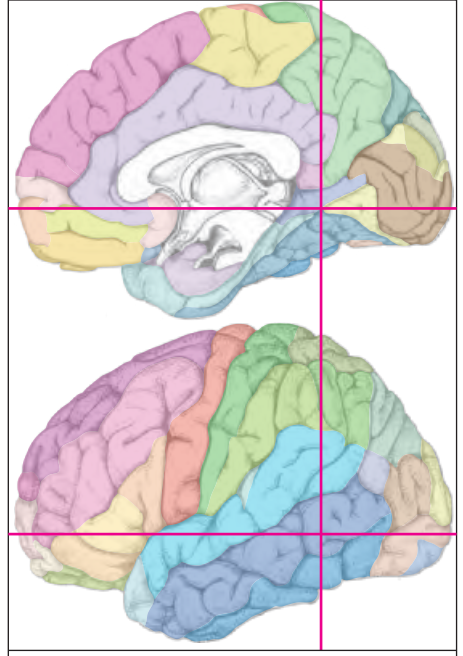






Cortex: Gyri and Sulci





MNI Position y = -54.92 mm
AHB Position y = 52.29 mm

Gyri

AAnG angular gyrus
AStr striate area
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
PHG parahippocampal gyrus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
impl anterior intermediate parietal sulcus (Jensen)
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

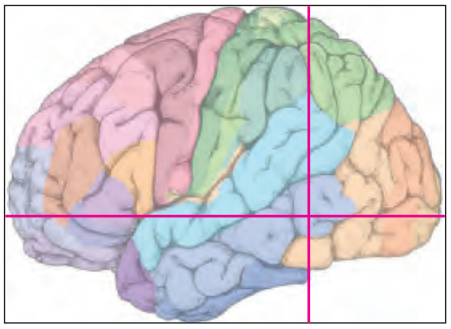
cgb cingulum bundle
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 72
Slice Nr. 4441

Cortex: Brodmann Areas

72

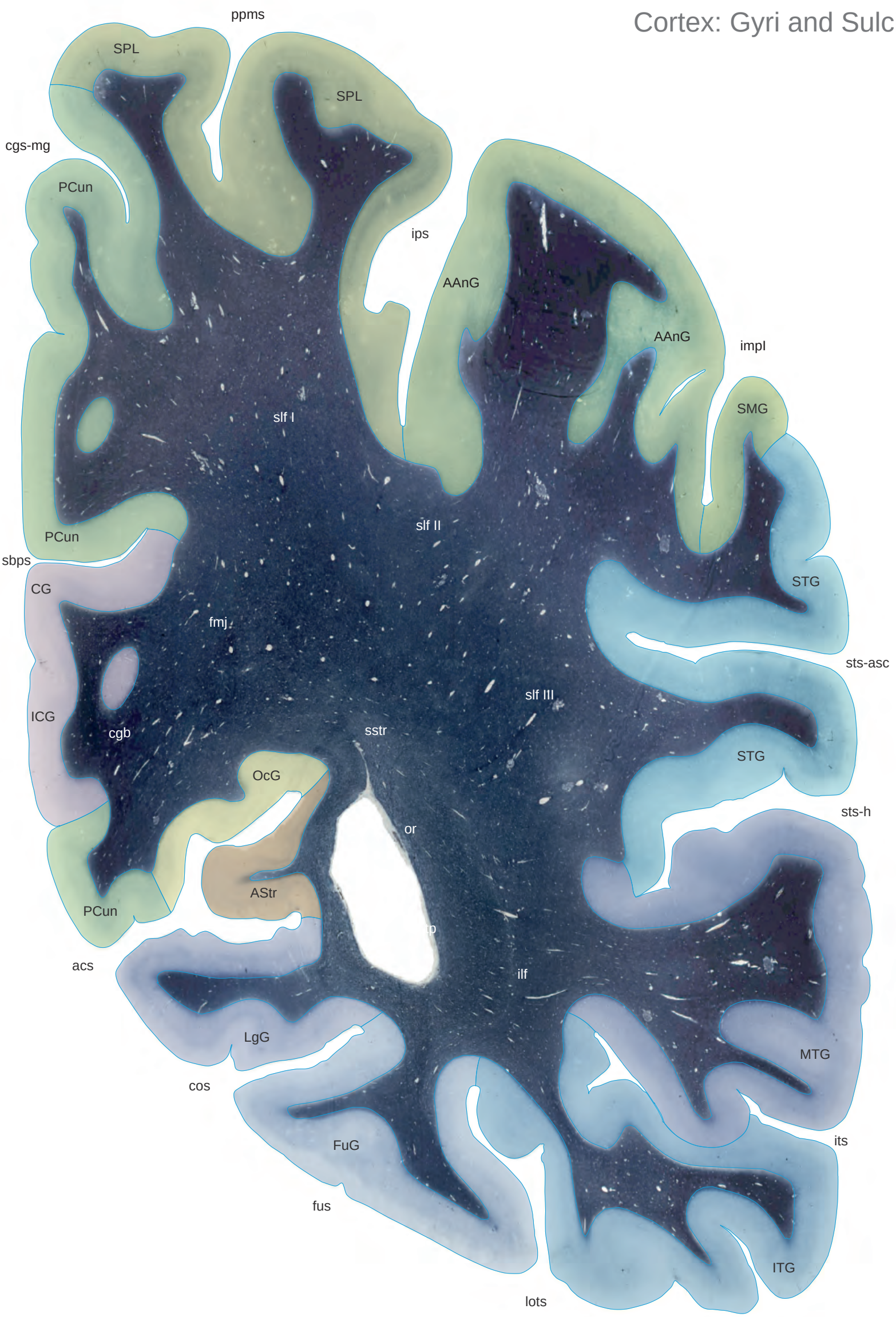
MNI: -54.92
ICL: 52.29
MCP: 37.55

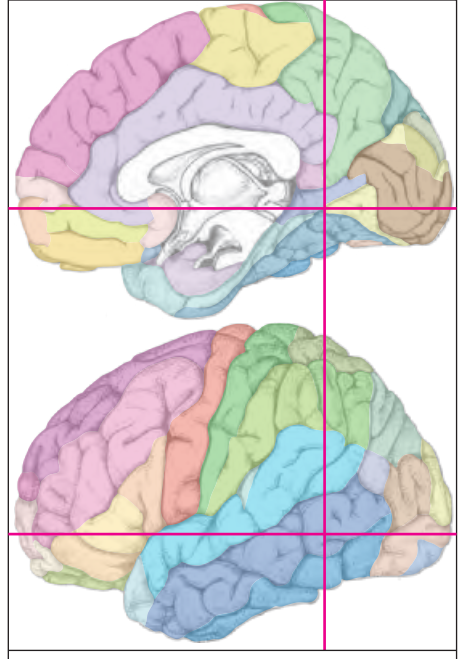


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cals callosal sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
impl anterior intermediate parietal sulcus of Jensen
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sbps subparietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -56.36 mm
AHB Position y = 53.66 mm

Gyri

AAnG angular gyrus
AStr striate area
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fus midfusiform sulcus
impl anterior intermediate parietal sulcus (Jensen)
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

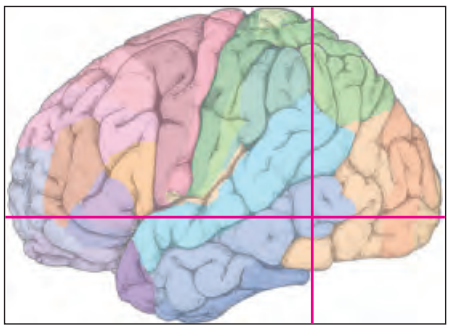
cgb cingulum bundle
fmj forceps major of the corpus callosum
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 73
Slice Nr. 4492

Cortex: Brodmann Areas

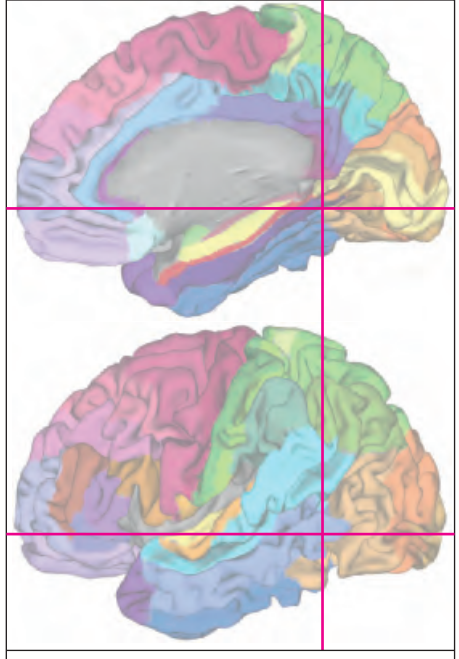
73

MNI: -56.36
ICL: 53.66
MCP: 38.92



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
fus midfusiform sulcus
impl anterior intermediate parietal sulcus of Jensen
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sbps subparietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment



MNI Position y = -56.33 mm
AHB Position y = 53.63 mm

Gyral Pattern

AAnG angular gyrus
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
PStr parastriate area
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA29 area retrolimbica granularis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA36 area ectorhinalis
BA37 area occipito-temporalis
BA39 area angularis
BA40 area supramarginalis

von Economo and Koskinas

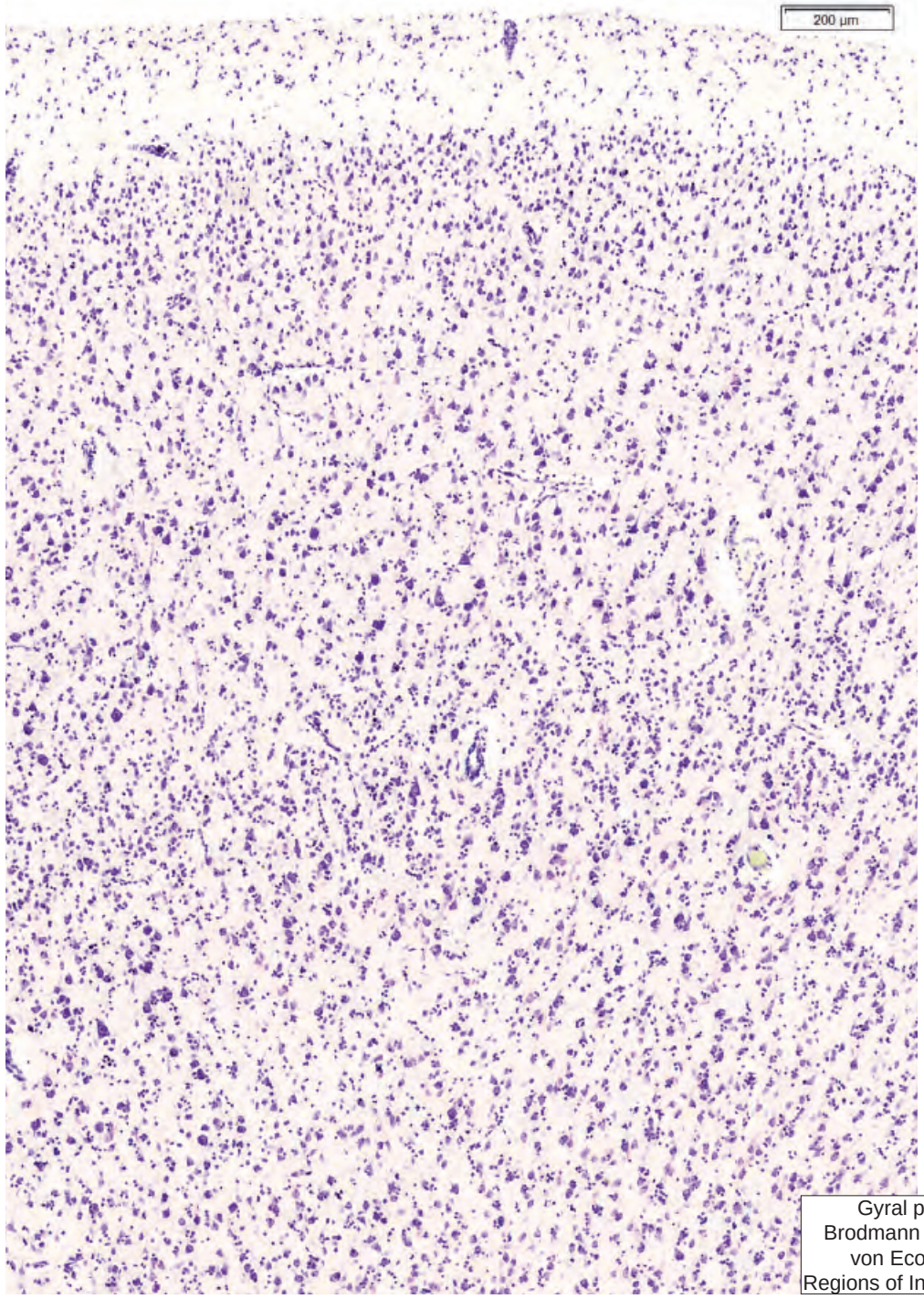
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
PA pyramidal post- and paracentral area
PC intermediate postcentral area
PE superior parietal area
PF supramarginal area
PG angular area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

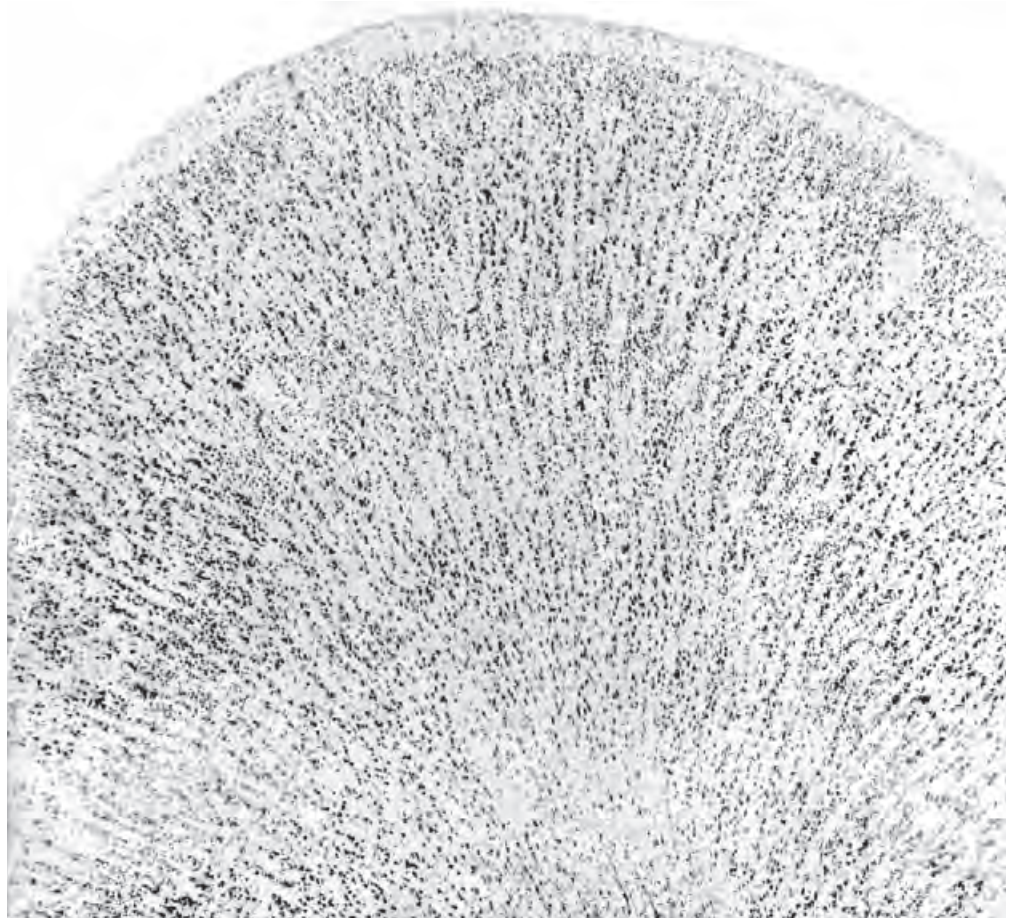
Regions of Interest

B. Vogt:
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31

stripe 1

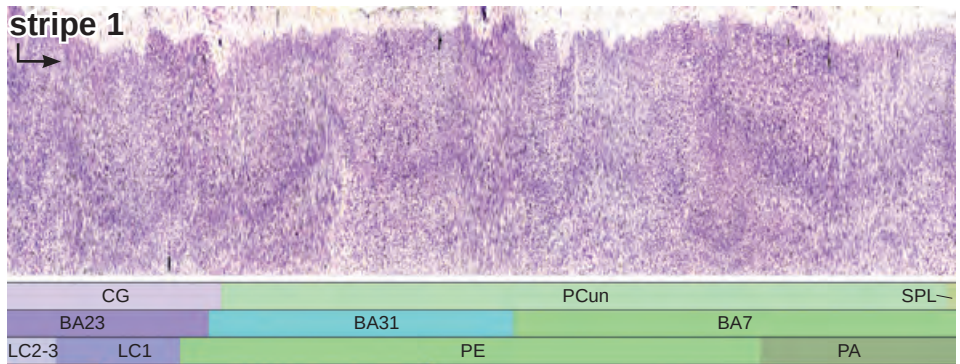
Cell stain (Nissl):
Section Nr. 73
Slice Nr. 4491



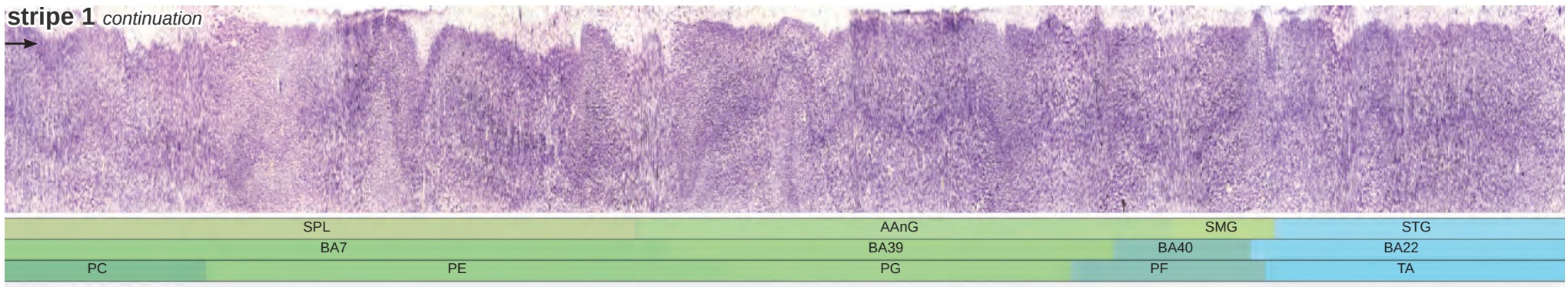


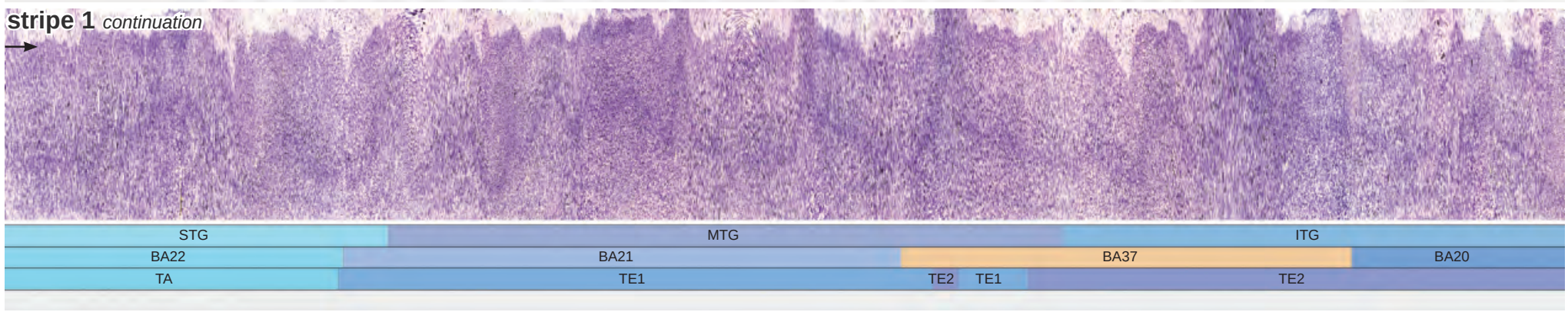
PE(m) Area parietalis superior (magnocellularis).

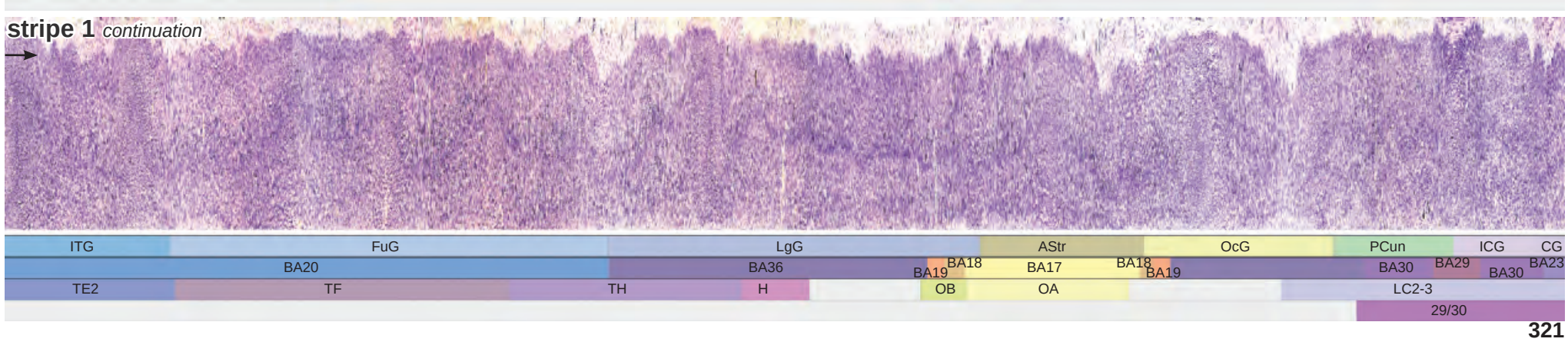
von Economo and Koskinas (1925) Plate LXIX (69)



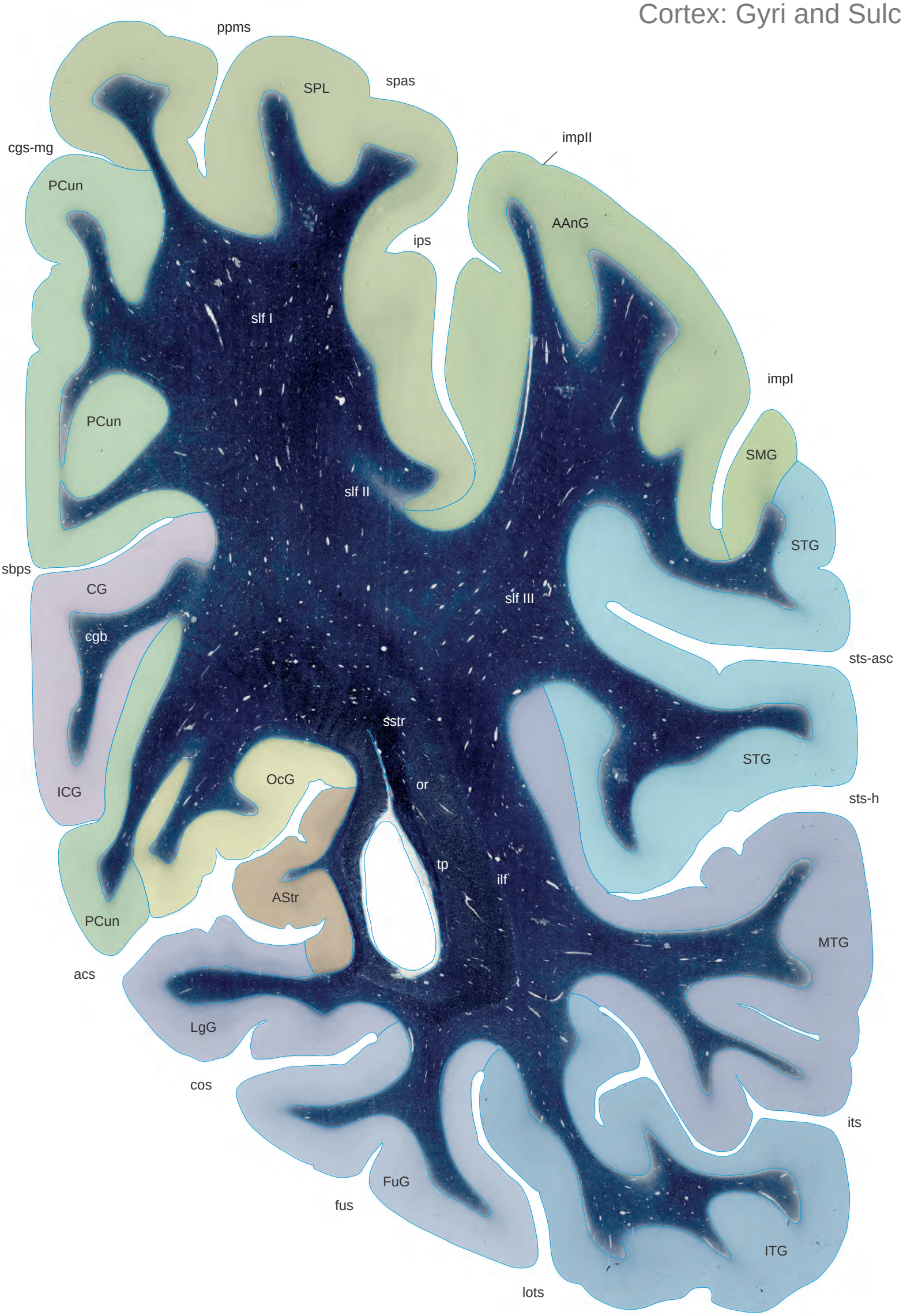
Gyral pattern
Brodmann areas
von Economo
Regions of Interest

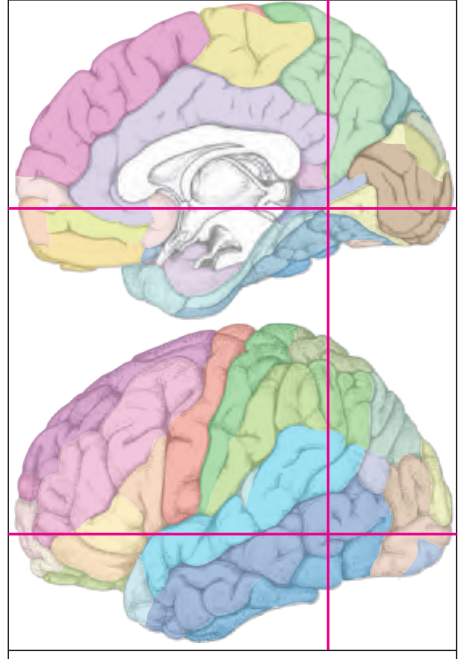






Cortex: Gyri and Sulci





MNI Position y = -57.65 mm
AHB Position y = 55.02 mm

Gyri

AAnG angular gyrus
AStr striate area
CG cingulate gyrus
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fus midfusiform sulcus
impI anterior intermediate parietal sulcus (Jensen)
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

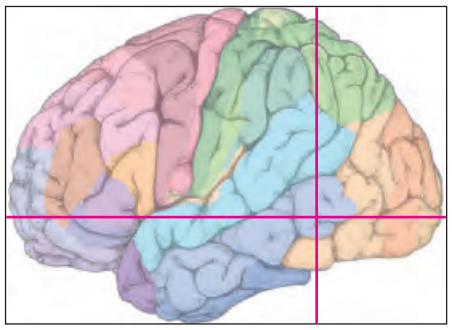
Fibers

cgb cingulum bundle
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 74
Slice Nr. 4543

Cortex: Brodmann Areas

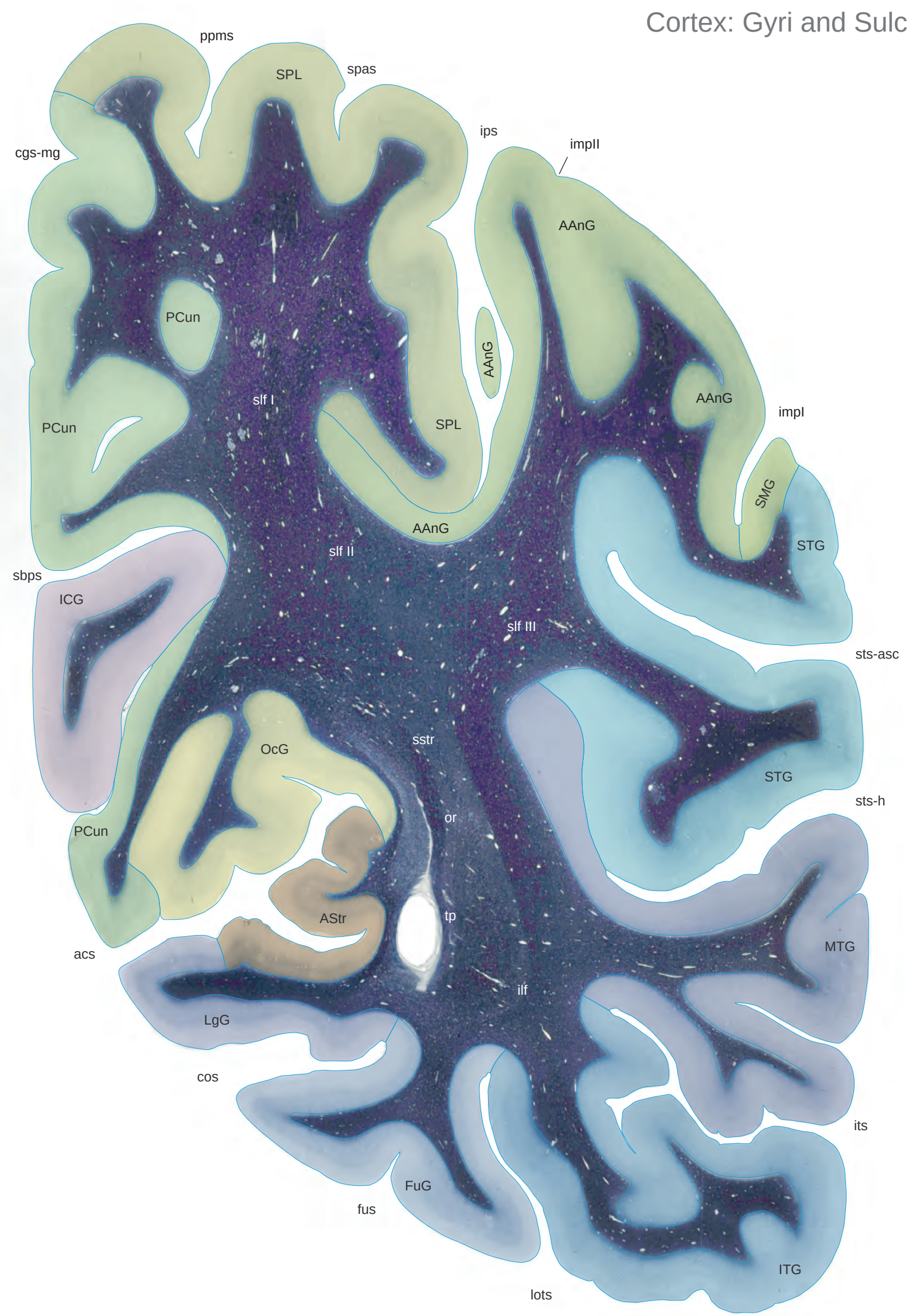
MNI: -57.65
ICL: 55.02
MCP: 40.28

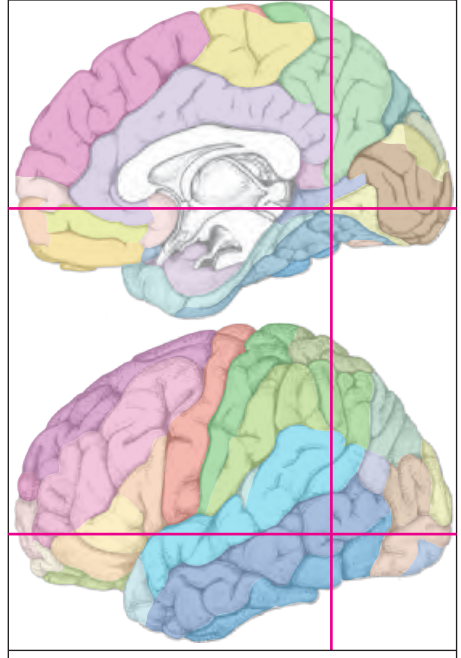


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
fus midfusiform sulcus
impl anterior intermediate parietal sulcus of Jensen
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -59.12 mm
AHB Position y = 56.28 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneusv
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cgs-mg cingulate sulcus, marginal part
cos collateral sulcusv
fus midfusiform sulcus
impI anterior intermediate parietal sulcus (Jensen)
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

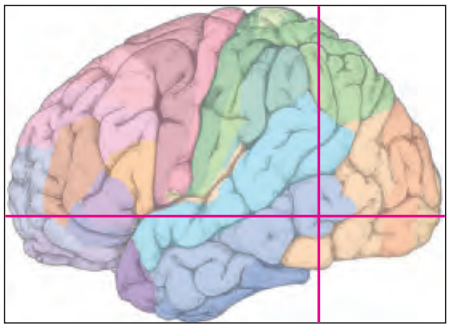
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 75
Slice Nr. 4590

Cortex: Brodmann Areas

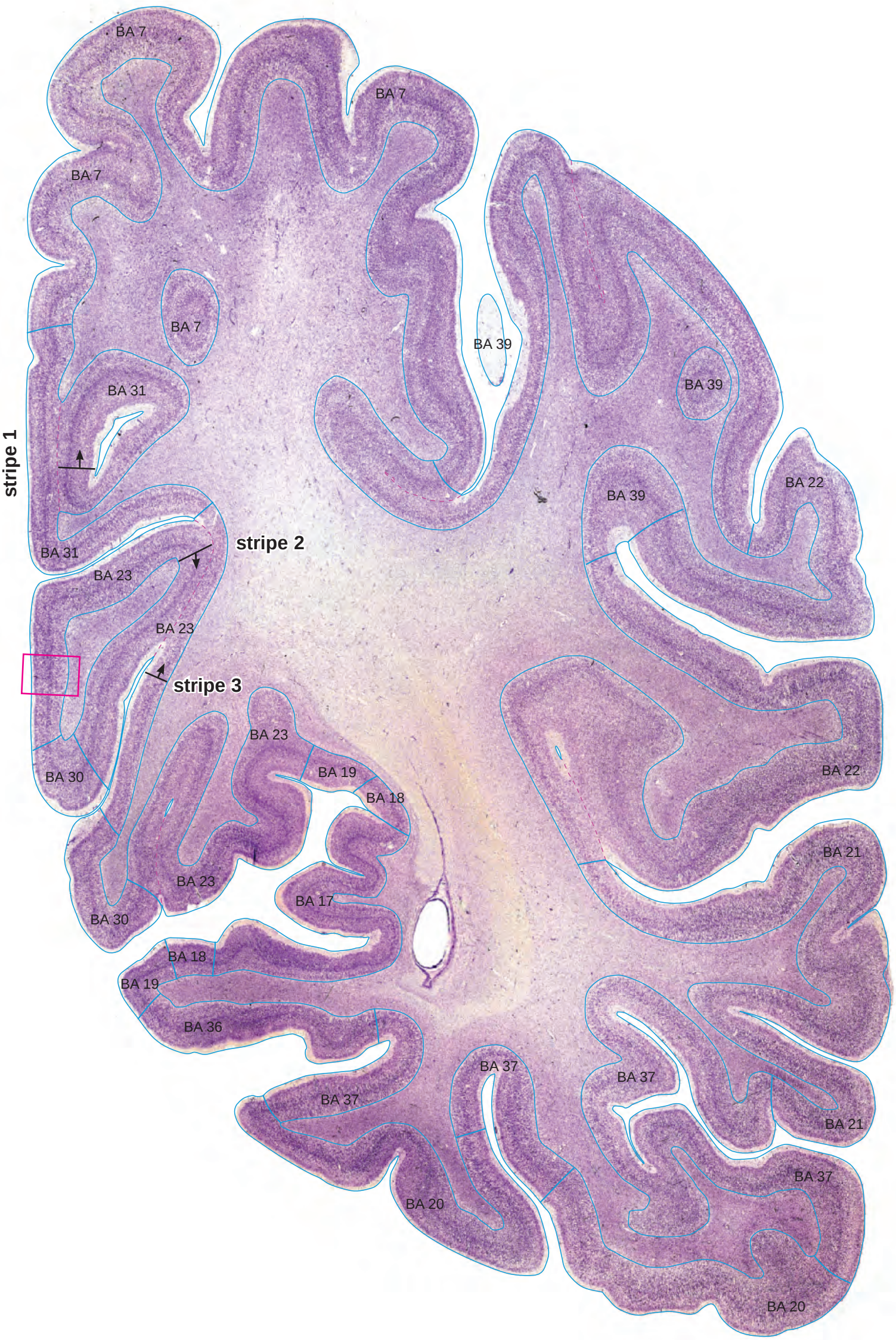
75

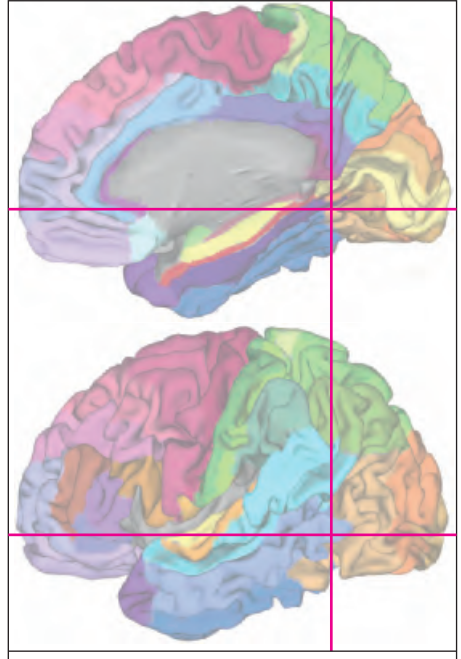
MNI: -59.12
ICL: 56.28
MCP: 41.54



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cgs-mg marginal segment of cingulate sulcus
cos collateral sulcus
fus midfusiform sulcus
impl anterior intermediate parietal sulcus of Jensen
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -59.09 mm
AHB Position y = 56.26 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ITG inferior temporal gyrus
LgG lingual gyrus (O5)
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneusv
PStr parastriate area
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA36 area ectorhinalis
BA37 area occipito-temporalis
BA39 area angularis

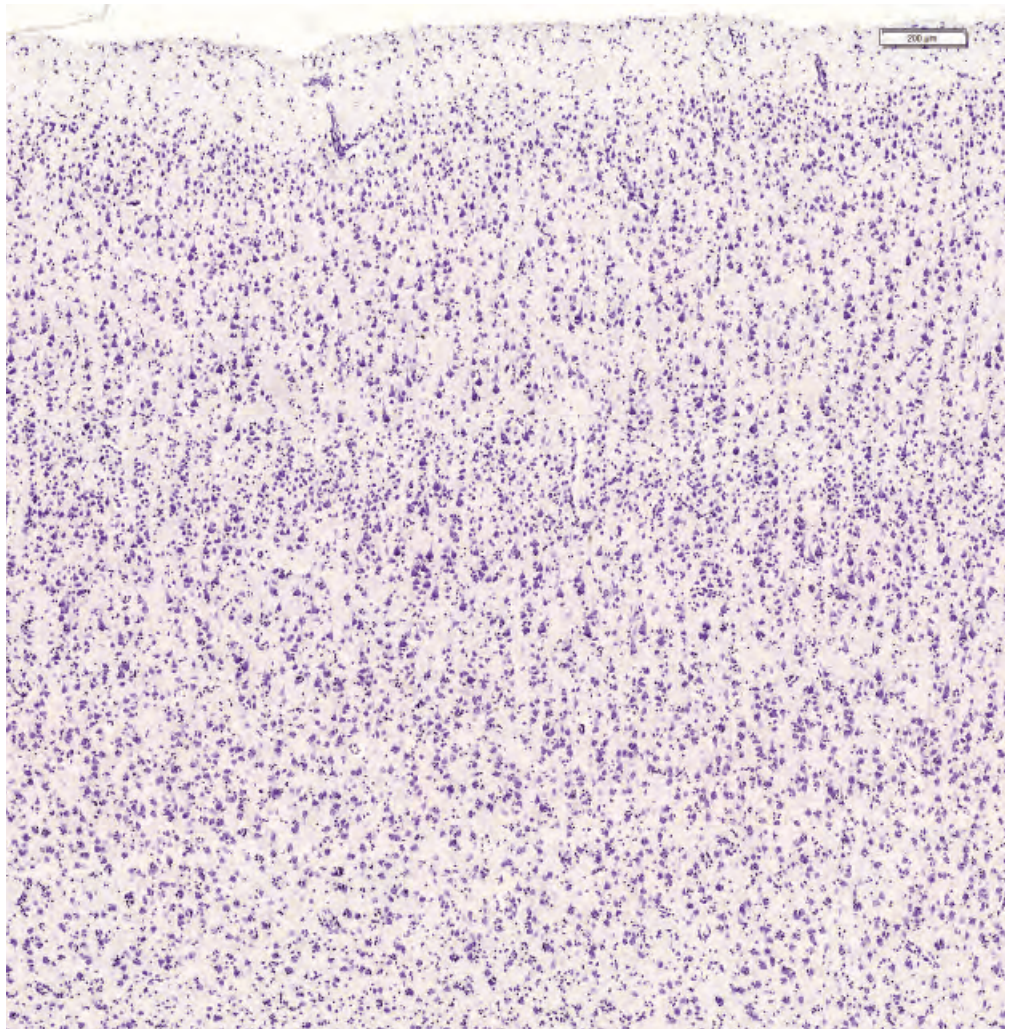
von Economo and Koskinas

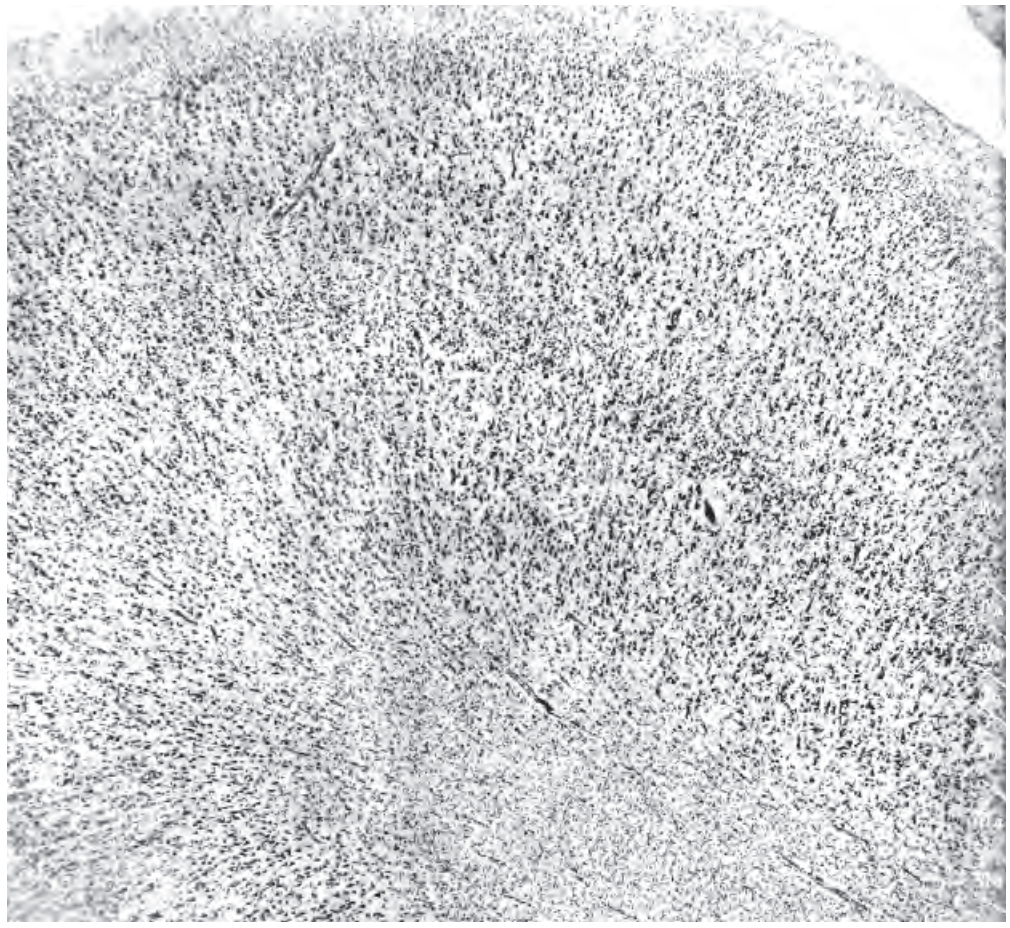
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PA pyramidal post- and paracentral area
PE superior parietal area
PF supramarginal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

B. Vogt:
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31
v23 subregion of BA 23

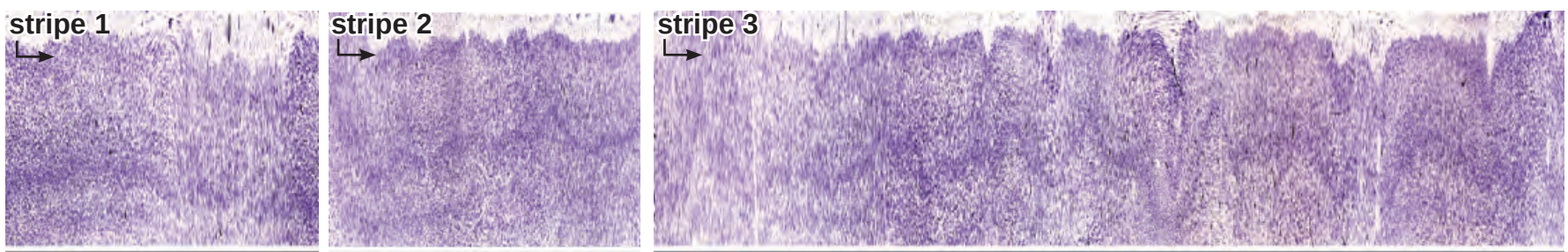
Cell stain (Nissl):
Section Nr. 75
Slice Nr. 4589





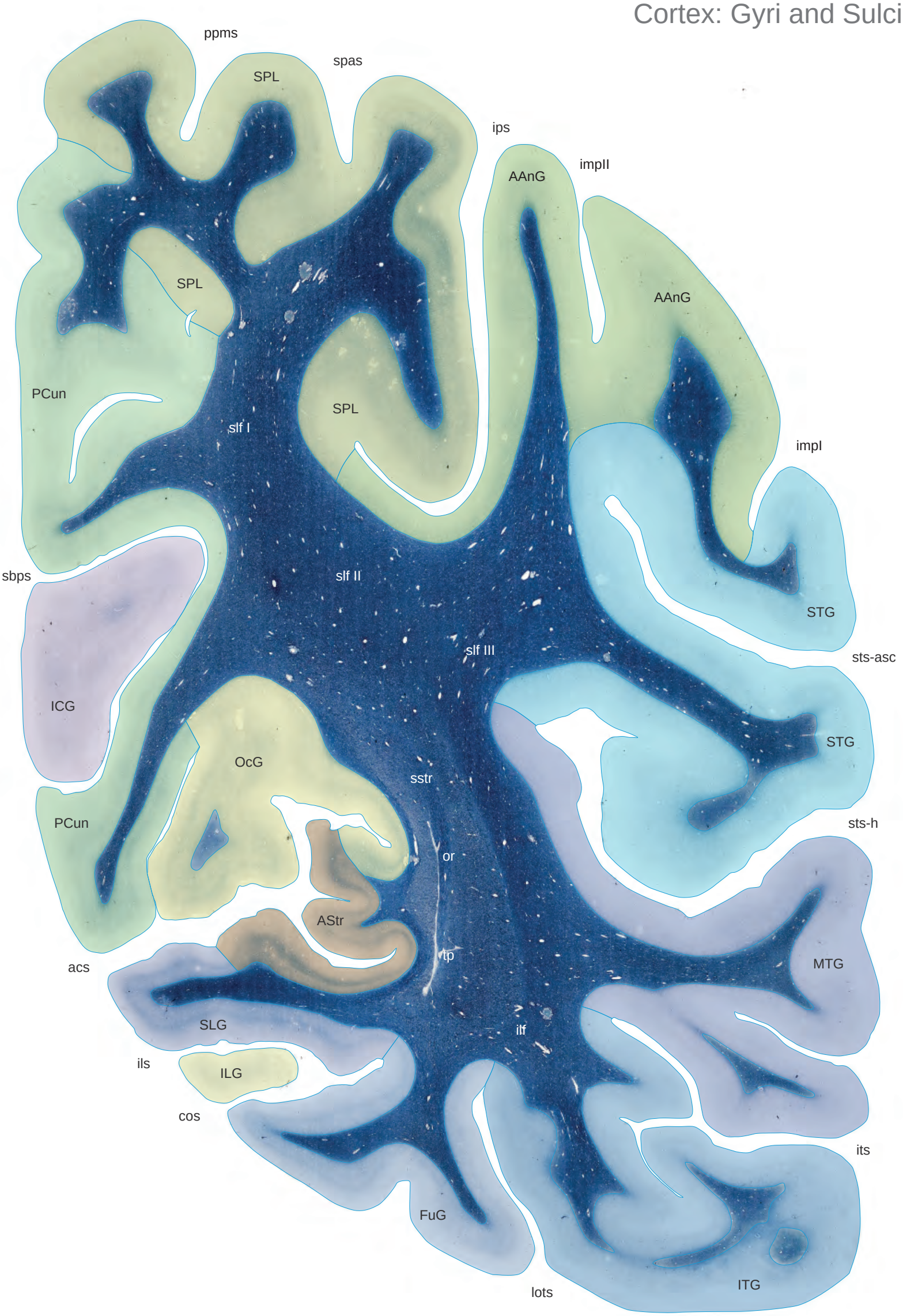
LC1 Area cingularis posterior dorsalis.

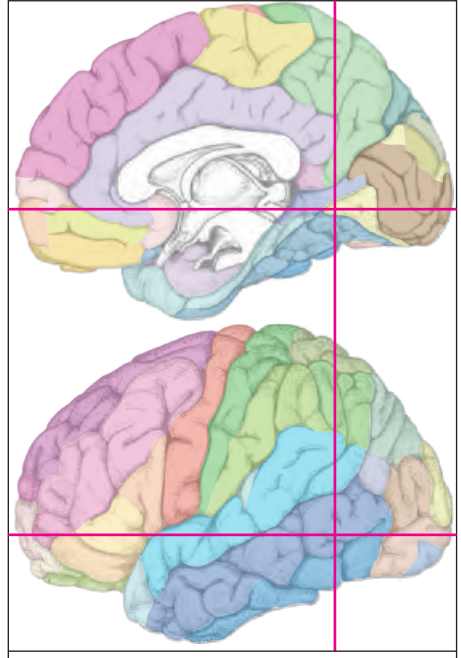
von Economo and Koskinas (1925) Plate XLVIII (48)



| Gyral pattern | | |

Cortex: Gyri and Sulci





MNI Position y = -60.55 mm
AHB Position y = 57.65 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impI anterior intermediate parietal sulcus (Jensen)
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

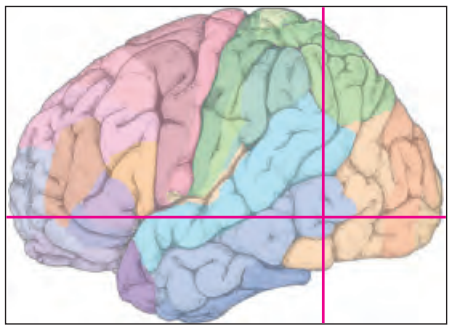
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 76
Slice Nr. 4641

Cortex: Brodmann Areas

76

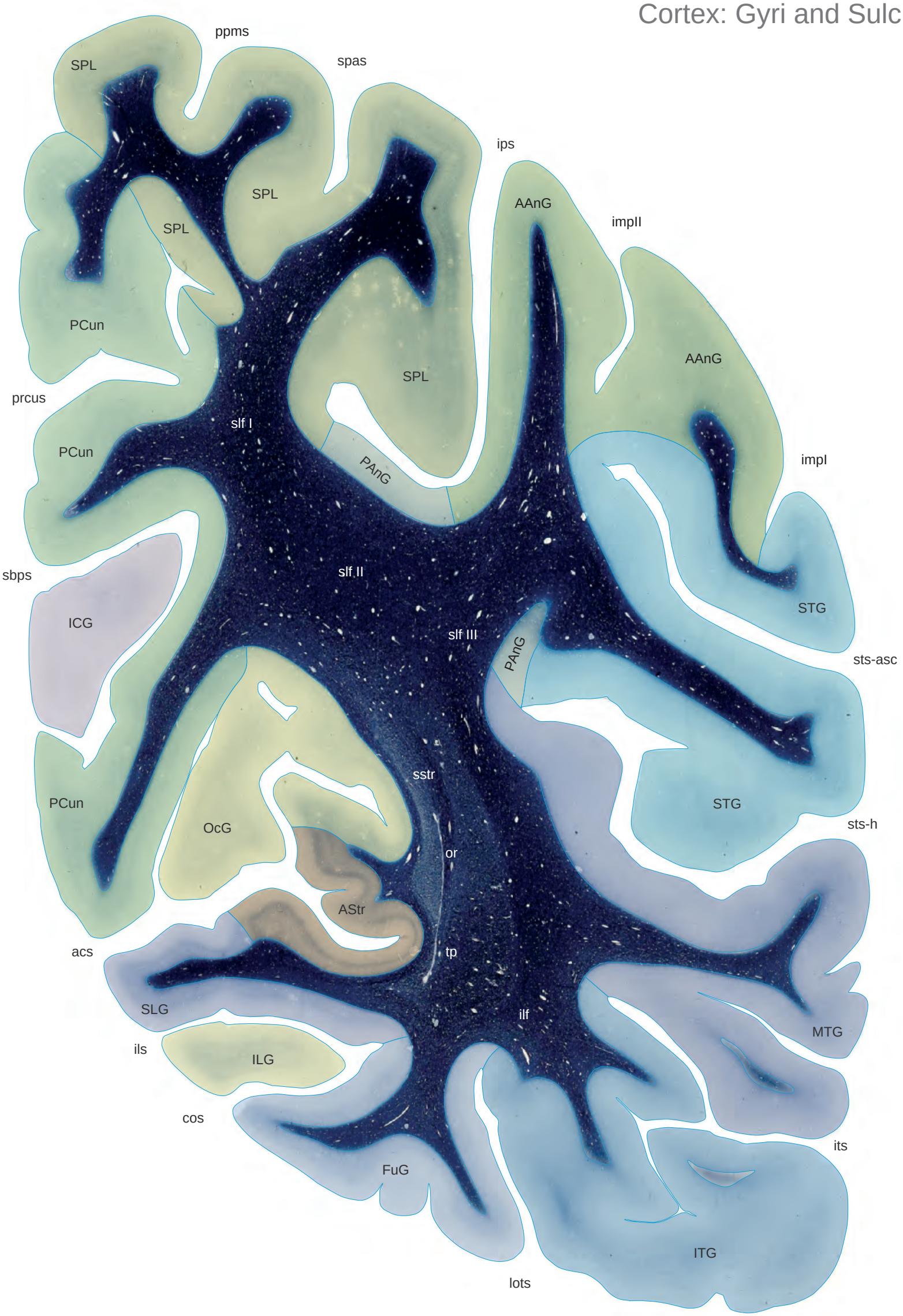
MNI: -60.55
ICL: 57.65
MCP: 42.91

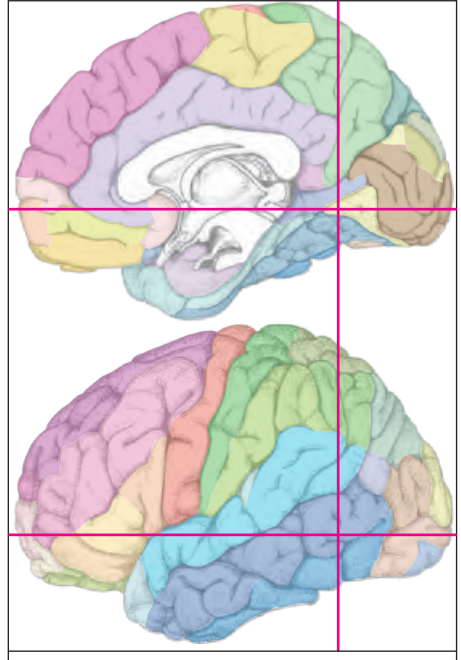


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
fus midfusiform sulcus
ils intralingual sulcus
impI anterior intermediate parietal sulcus of Jensen
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -61.88 mm
AHB Position y = 58.91 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impI anterior intermediate parietal sulcus (Jensen)
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
prcus precuneal sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

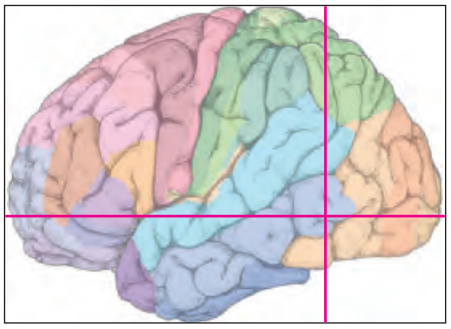
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 77
Slice Nr. 4688

Cortex: Brodmann Areas

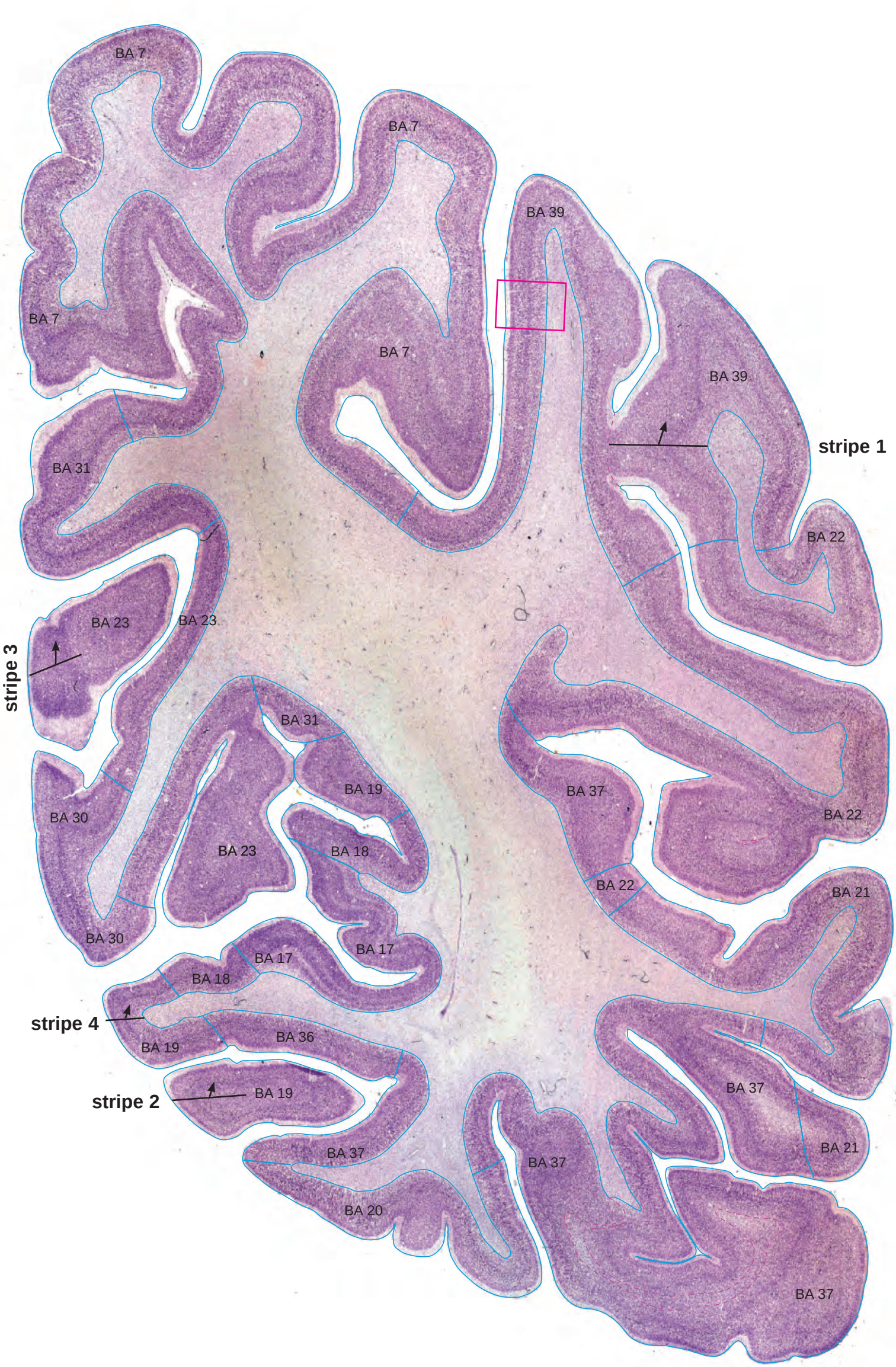
77

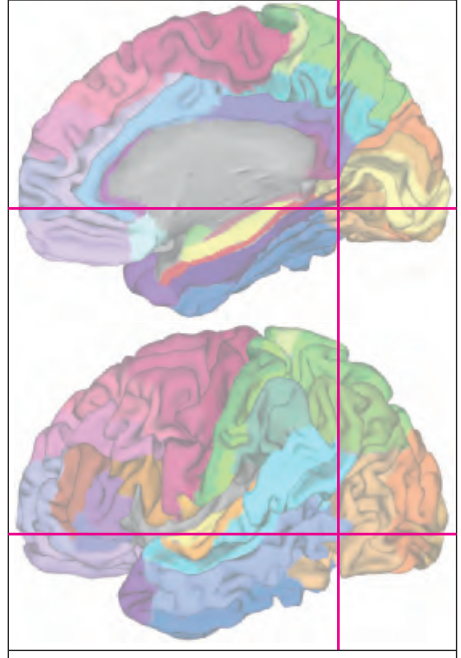
MNI: -61.88
ICL: 58.91
MCP: 44.17



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
impl anterior intermediate parietal sulcus of Jensen
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -61.96 mm
AHB Position y = 58.99 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ICG isthmus of cingulate gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
PStr parastriate area
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA30 area retrolimbica agranularis
BA31 area cingularis posterior dorsalis
BA36 area ectorhinalis
BA37 area occipito-temporalis
BA39 area angularis

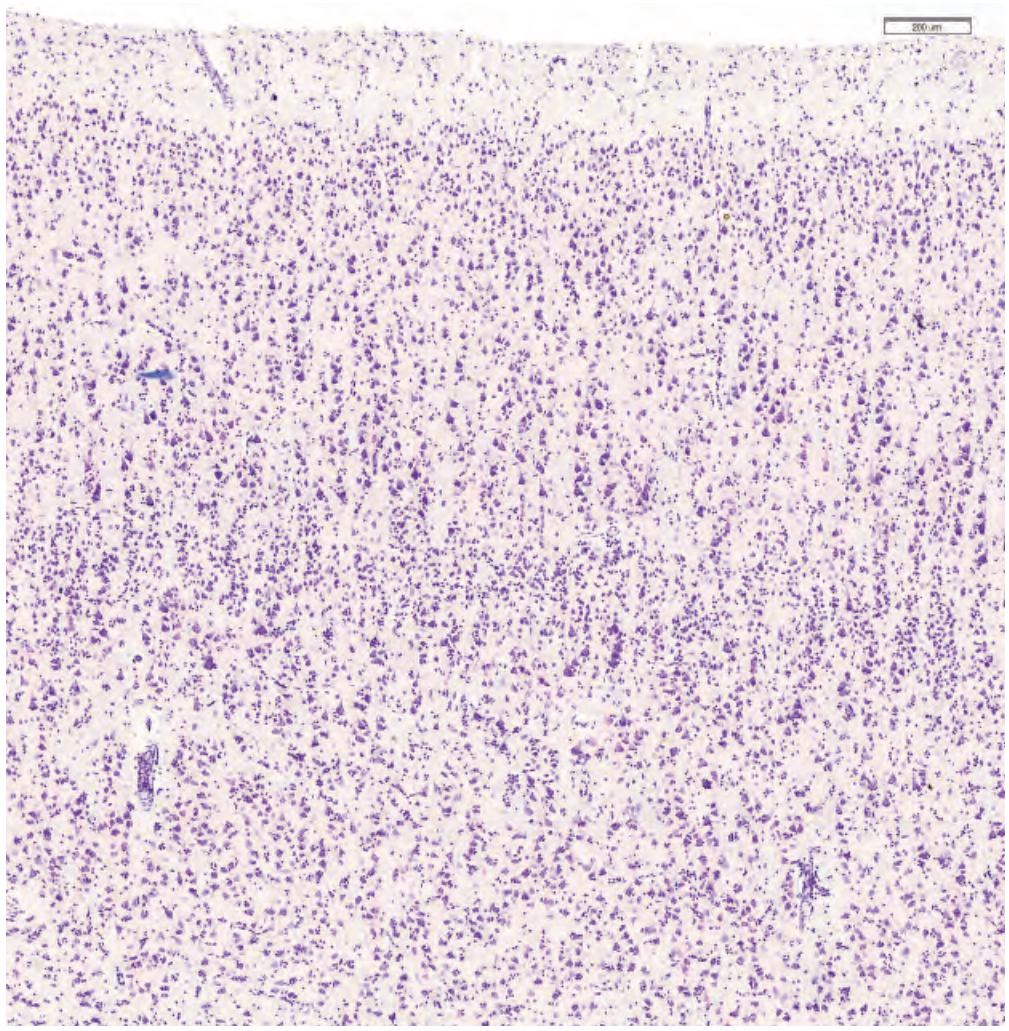
von Economo and Koskinas

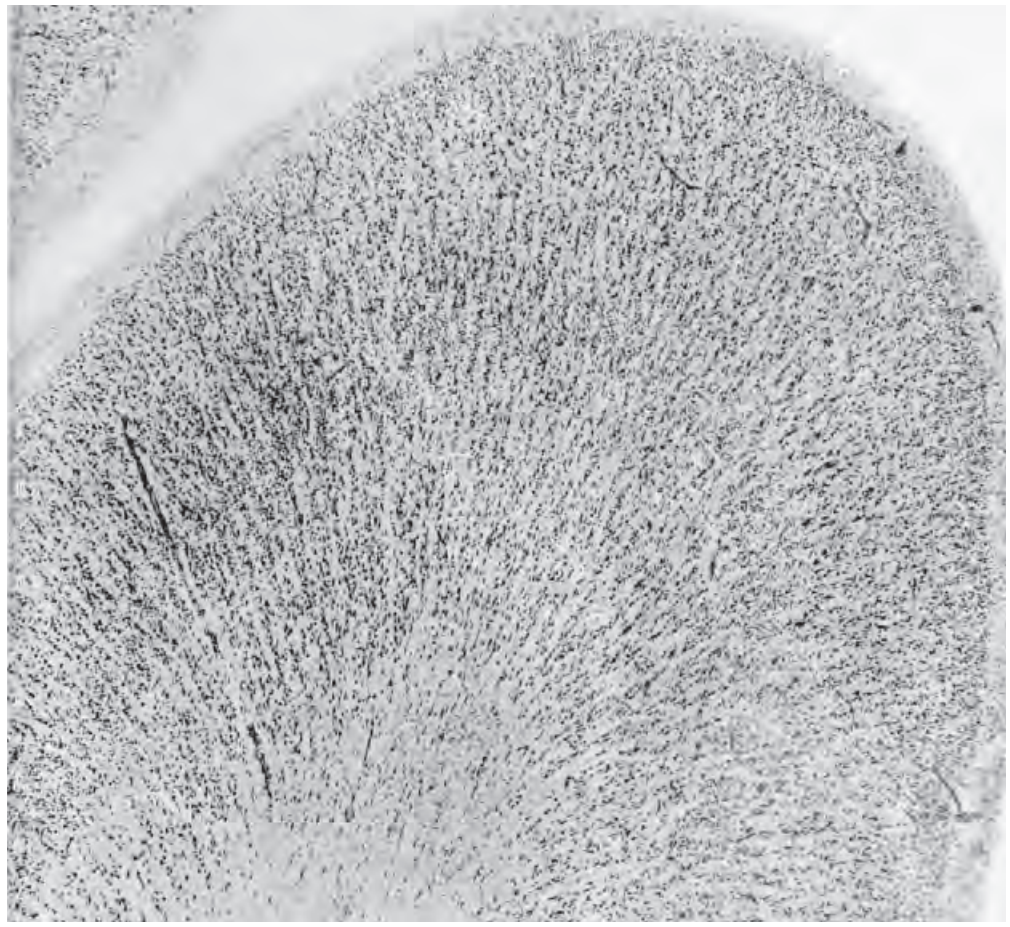
H hippocampal area
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PA pyramidal post- and paracentral area
PE superior parietal area
PF supramarginal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

B. Vogt:
23v ventral division of 23
29/30 BA 29 and BA30
d31 dorsal subregion of BA 31
v23 subregion of BA 23
v31 ventral subregion of BA 31

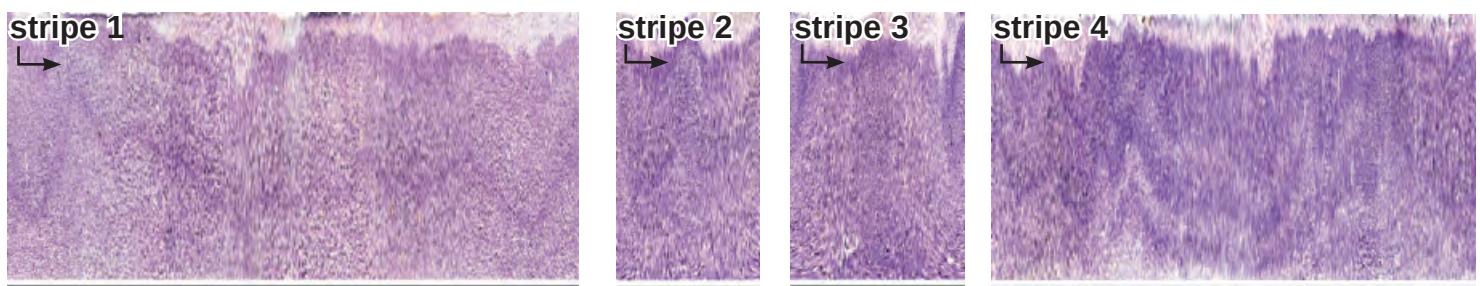
Cell stain (Nissl):
Section Nr. 77
Slice Nr. 4691





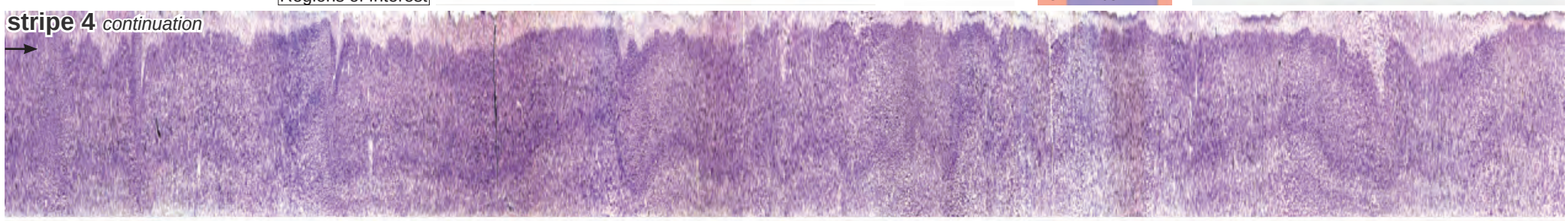
PE(p) Area parietalis superior (parvocellularis).

von Economo and Koskinas (1925) Plate LXX (70)



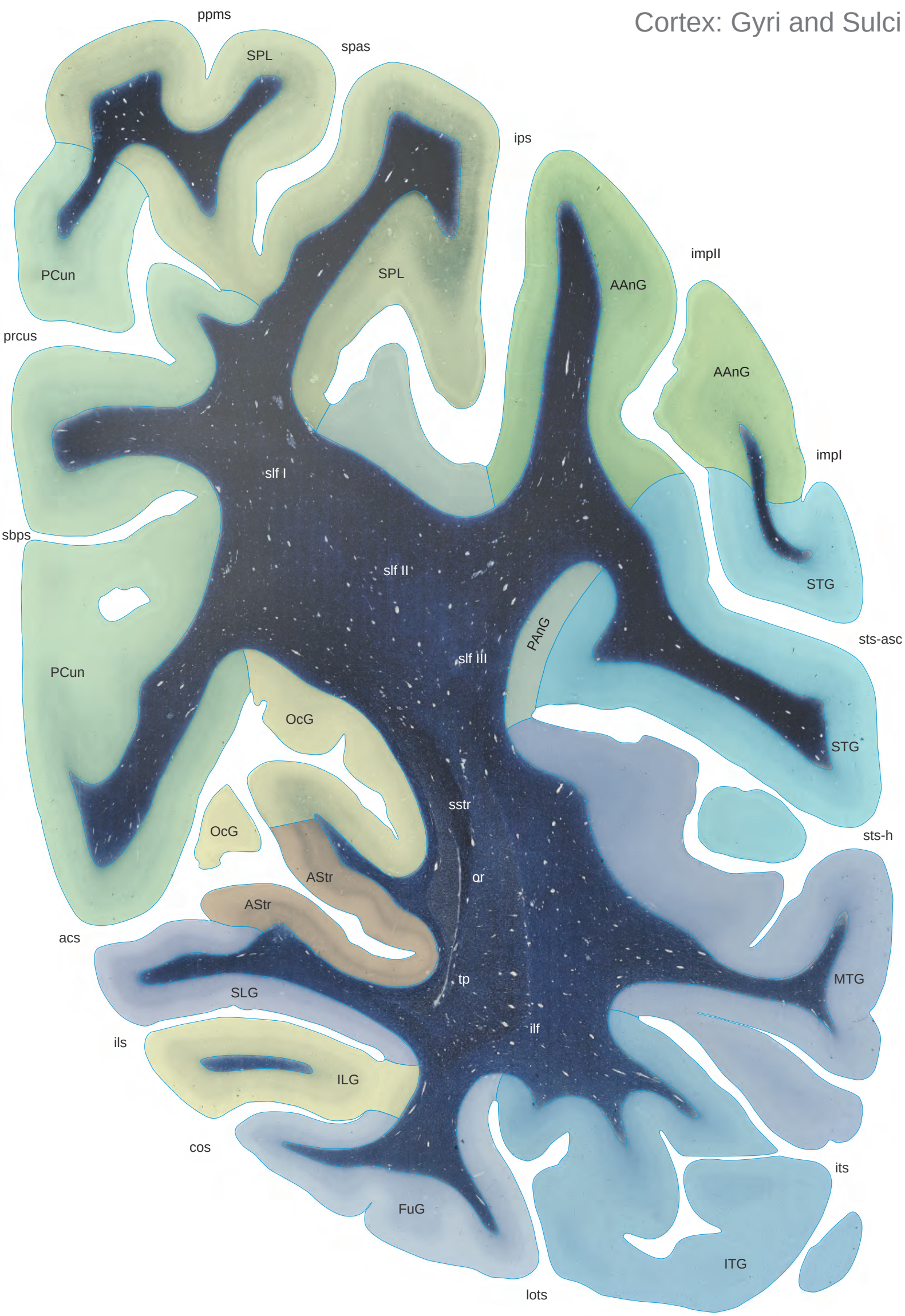
Gyral pattern
Brodmann areas
von Economo
Regions of Interest

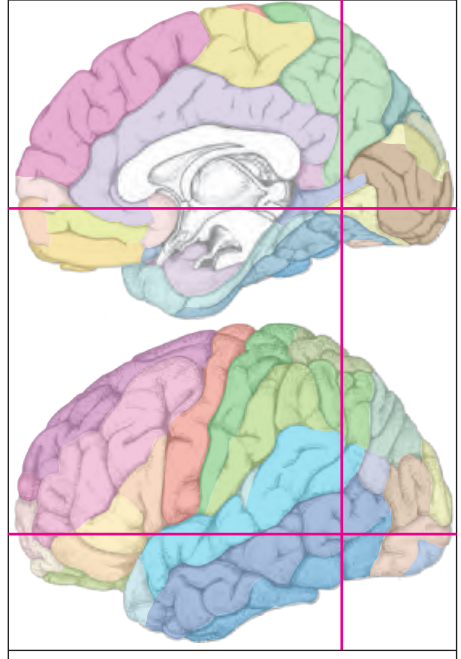
AAnG					STG							ILG			ICG				SLG			AStr			OcG	
BA39					BA22					BA39		BA19			BA23				BA19	BA18		BA17			BA18	
PG			PF				TA			PG		OA			LC2-3		LC1		LC2-3	OA		OB		OC		OB	OA
															23v		d31		23v							



| | | | | | | | | | | | | | | | | | | |

Cortex: Gyri and Sulci





MNI Position y = -63.34 mm
AHB Position y = 60.30 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impI anterior intermediate parietal sulcus (Jensen)
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms parietal paramidline sulcus
prcus precuneal sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

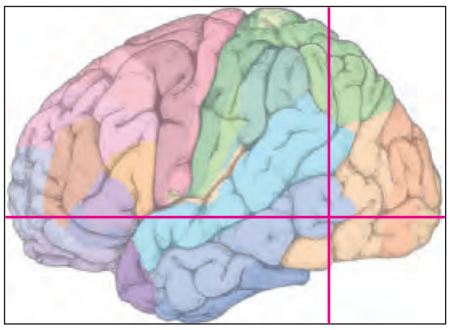
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 78
Slice Nr. 4740

Cortex: Brodmann Areas

78

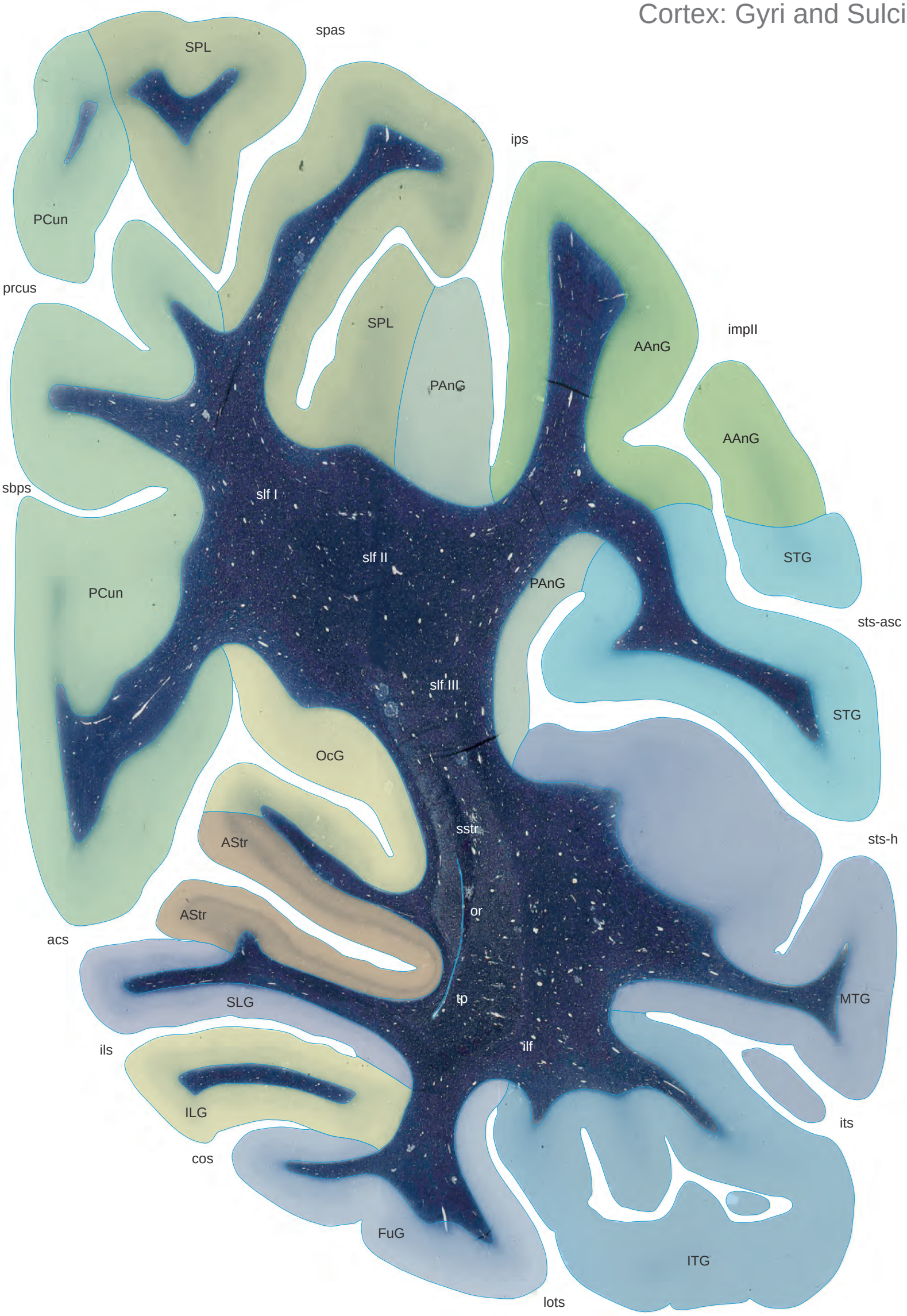
MNI: -63.34
ICL: 60.30
MCP: 45.56

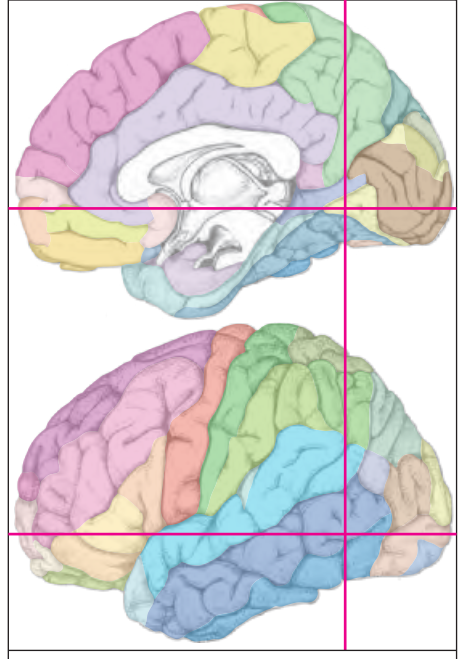


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
impI anterior intermediate parietal sulcus of Jensen
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
ppms posterior paramidline sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -64.78 mm
AHB Position y = 61.62 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
prcus precuneal sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

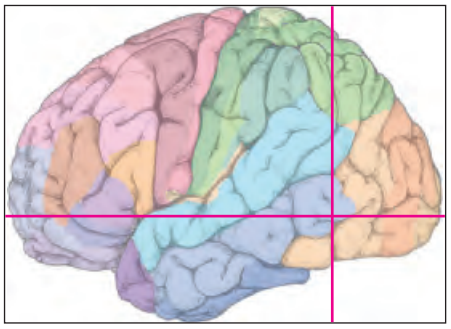
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 79
Slice Nr. 4789

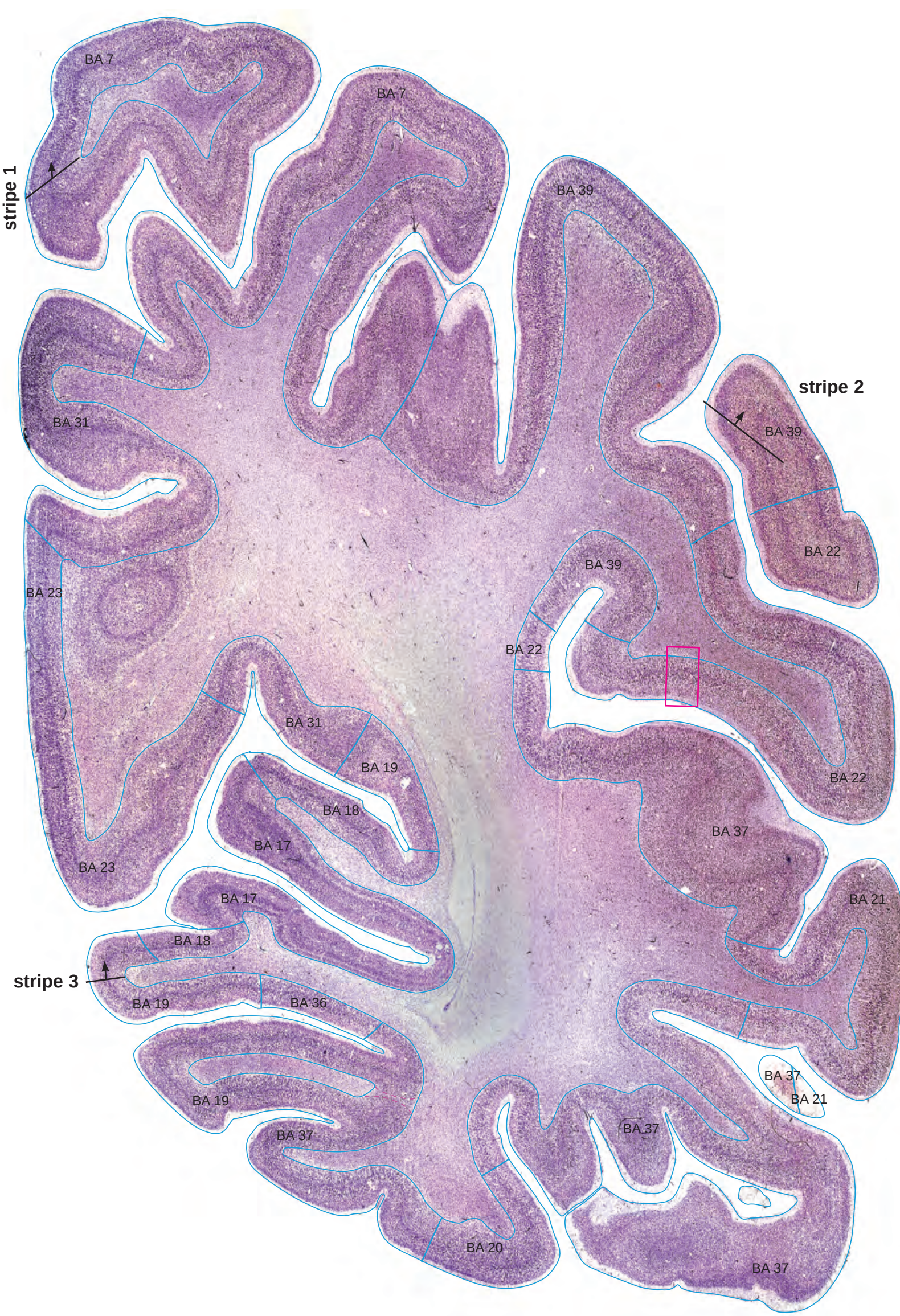
Cortex: Brodmann Areas

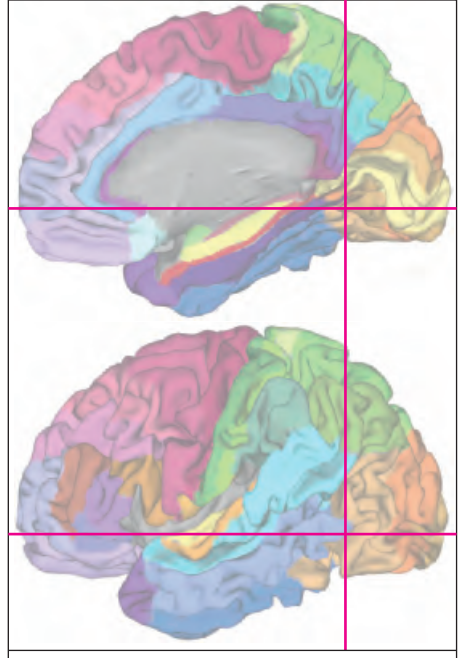
MNI: -64.78
ICL: 61.62
MCP: 46.88



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -64.83 mm
AHB Position y = 61.72 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA20 area temporalis inferior
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA36 area ectorhinalis
BA37 area occipito-temporalis
BA39 area angularis

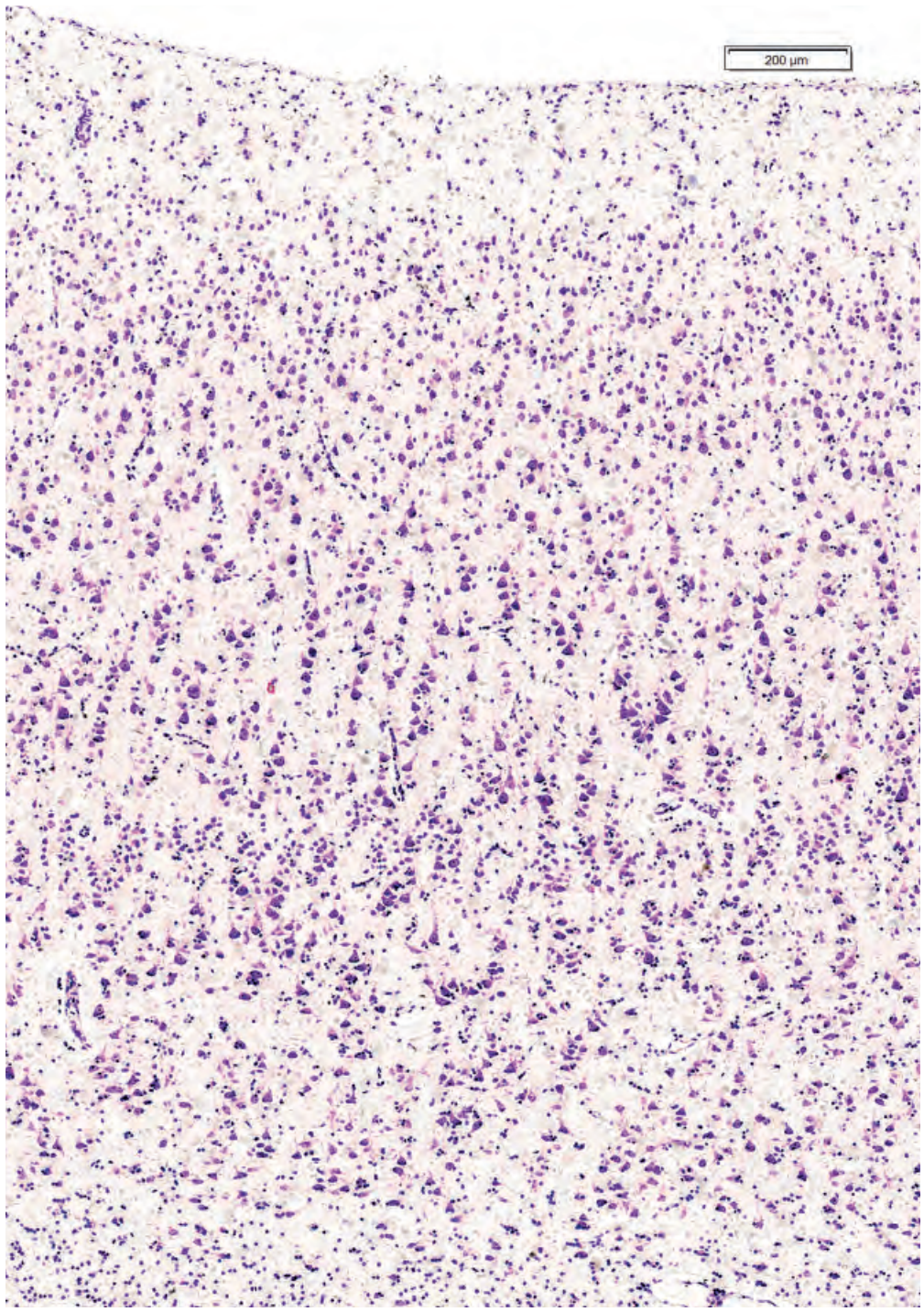
von Economo and Koskinas

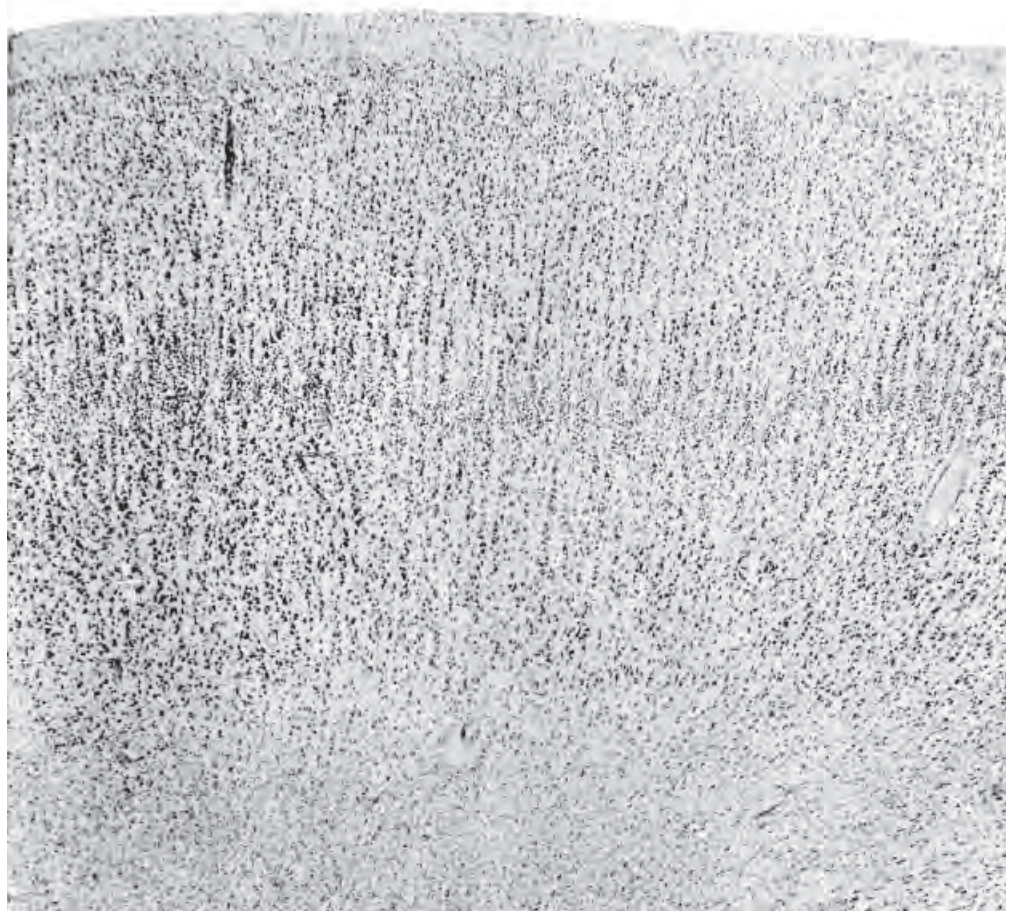
LC1 dorsal posterior cingulate area
LC2-3 posterior and limitans cingulate area
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PA pyramidal post- and paracentral area
PE superior parietal area
PF supramarginal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE1 middle temporal area proper
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v23 subregion of BA 23
v31 ventral subregion of BA 31

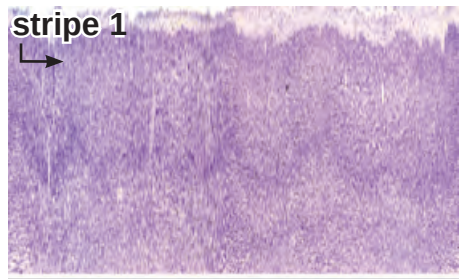
Cell stain (Nissl):
Section Nr. 79
Slice Nr. 4793



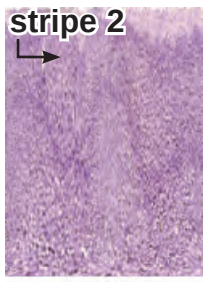


PHP Area parietalis basalis im limine parietali

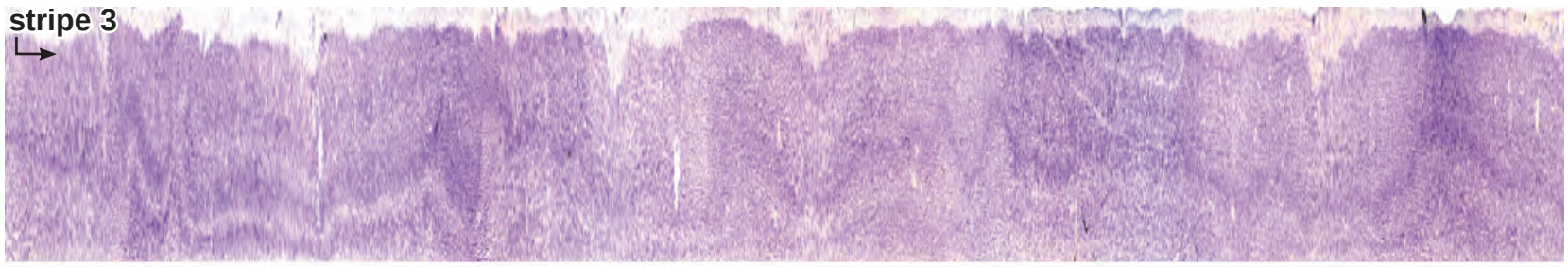
von Economo and Koskinas (1925) Plate LXXVIII (78)



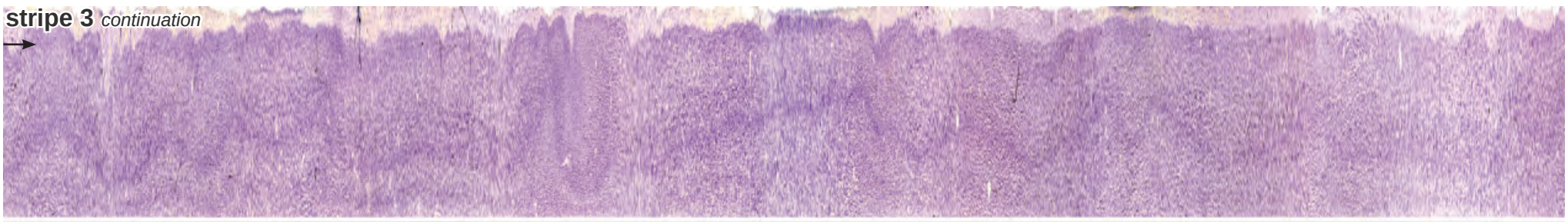
Gyral pattern	PCun	SPL	PCun
Brodmann areas	BA7	BA7	
von Economo	PE	PA	PE
Regions of Interest			



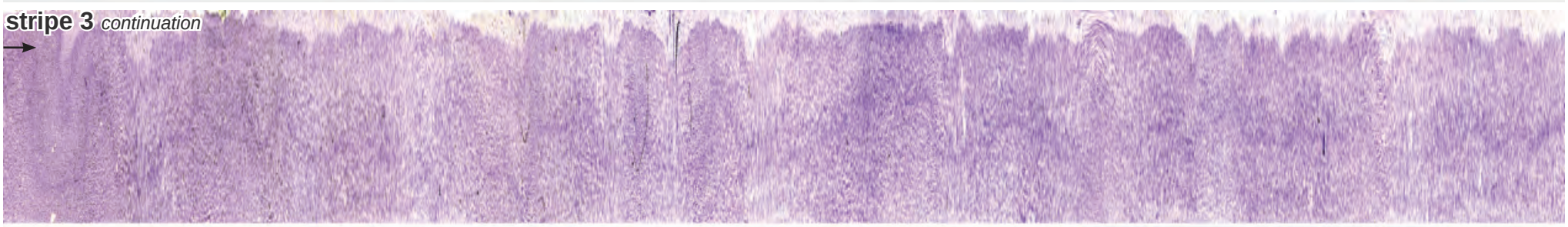
AAnG	STG	AAnG
BA39	BA22	BA39
PG PF	TA	PG



SLG	AStr	OcG	PCun							
BA19	BA18	BA17	BA18	BA19	BA31	BA23	BA31	BA7		
OA	OB	OC	OB	OA	LC1	PE	LC1	LC2-3	LC1	PE
						v31	v23	v31	d31	

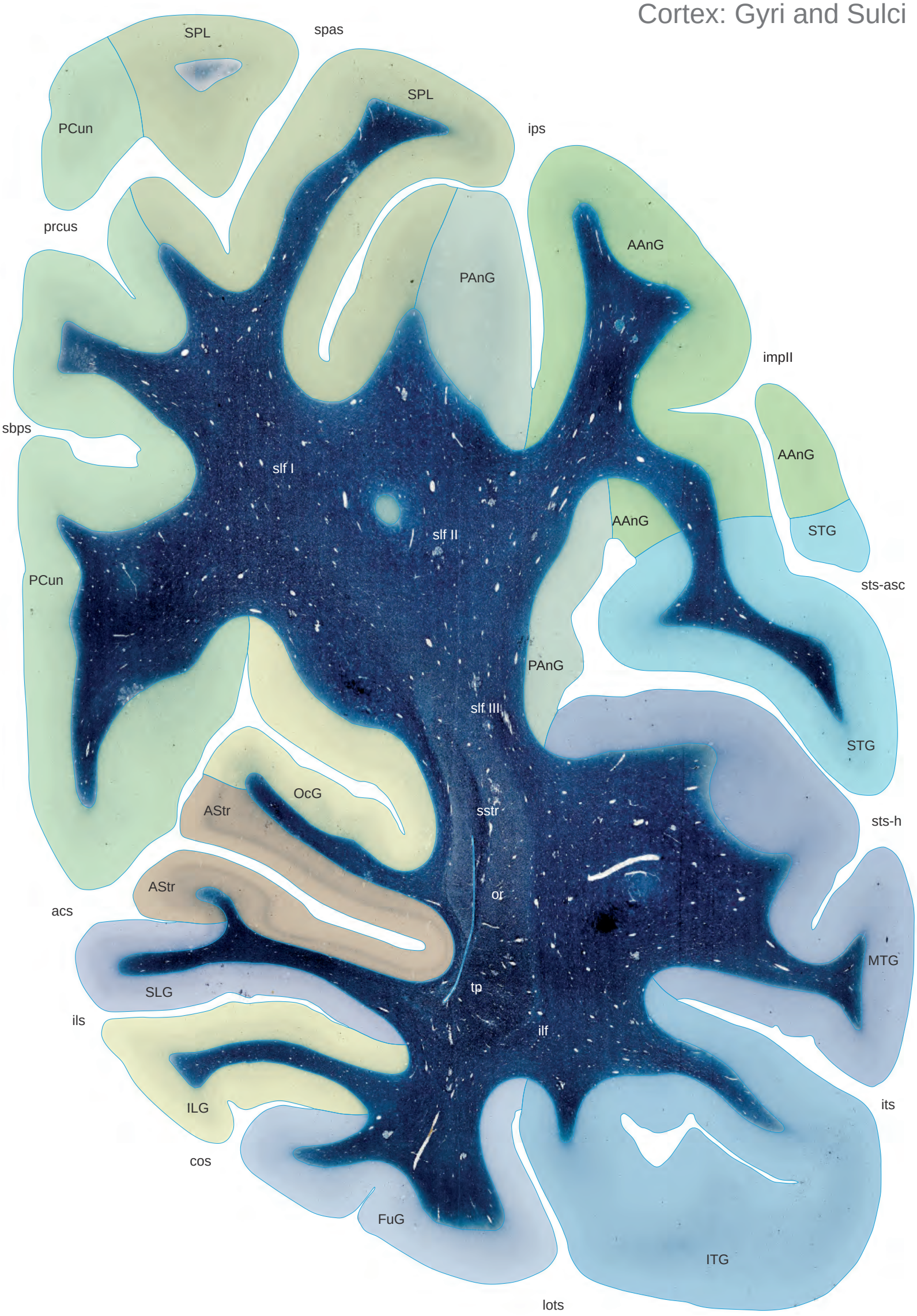


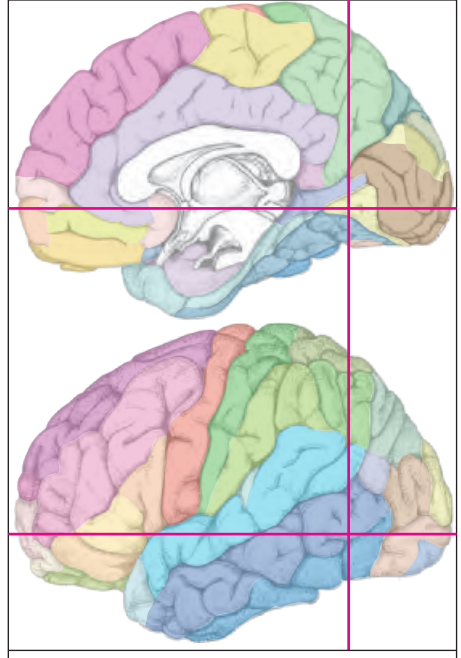
PCun	SPL	PAnG	AAnG	STG	PAnG	MTG
BA7		BA39		BA22	BA39 BA22	BA37
PE		PG		TA	PG	PH



MTG	ITG	FuG	ILG	SLG		
BA37	BA21	BA37	BA20	BA37	BA19	BA37 BA36	BA19
PH	TE1	TE2	TF	TH	OA	TH	OA

Cortex: Gyri and Sulci





MNI Position y = -66.13 mm
AHB Position y = 62.96 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG inferior lingual gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
prcus precuneal sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending branch
sts-h superior temporal sulcus, horizontal segment (sts-2)

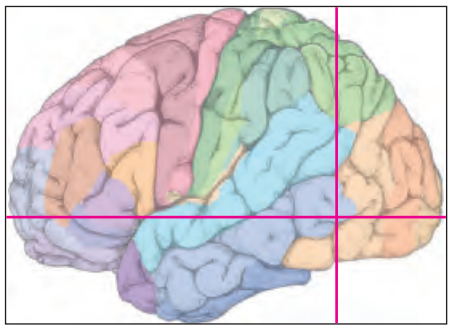
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 80
Slice Nr. 4839

Cortex: Brodmann Areas

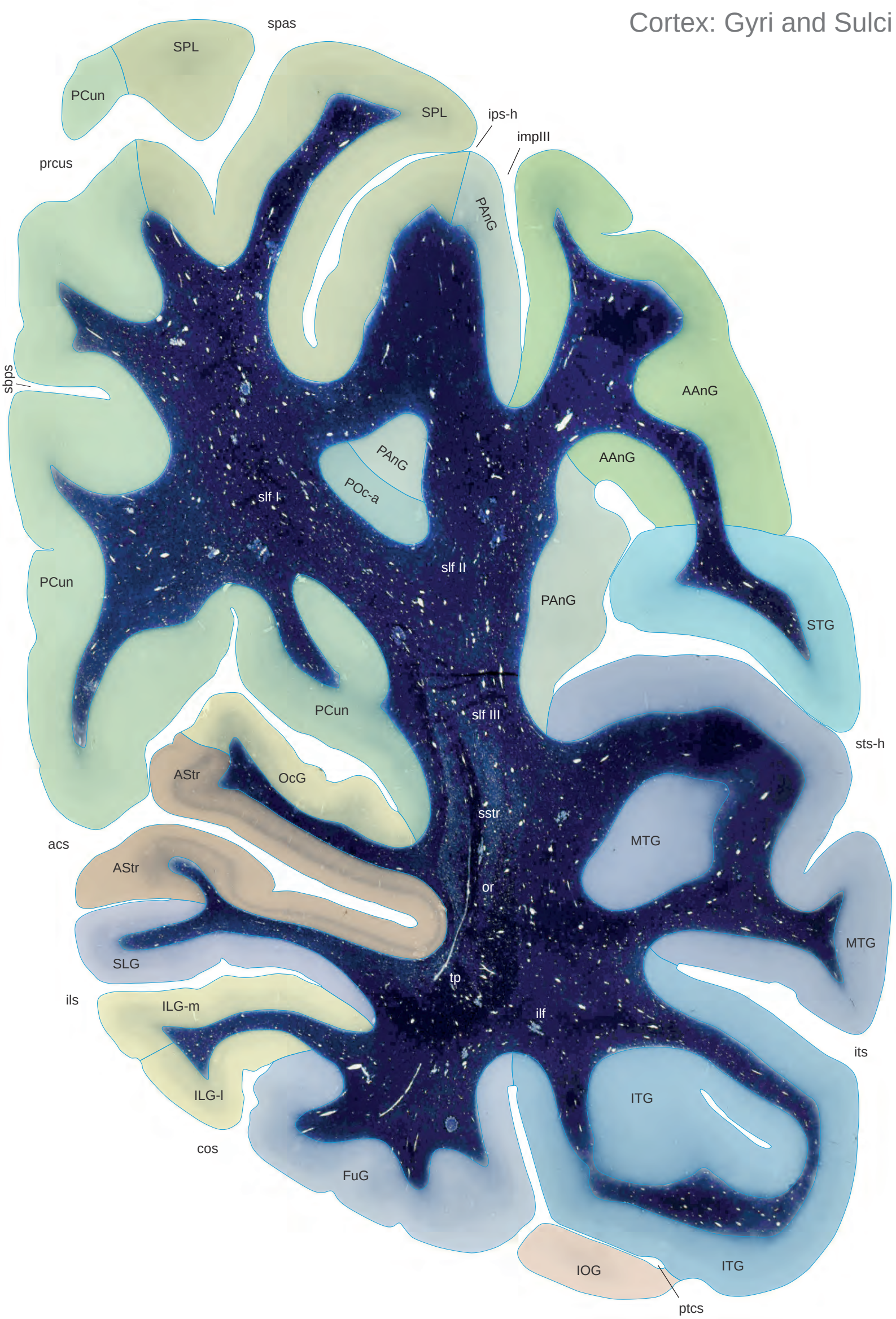
MNI: -66.13
ICL: 62.96
MCP: 48.22

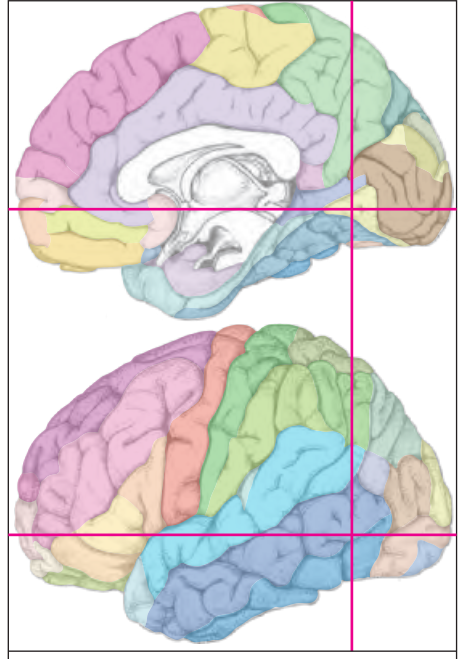


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
impII second intermediate parietal sulcus
ips intraparietal sulcus
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-asc superior temporal sulcus, ascending posterior segment
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -67.45 mm
AHB Position y = 64.21 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impIII third intermediate parietal sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
prcus precuneal sulcus
ptcs posterior transverse collateral sulcus
sbps subpavrietal sulcus
spas superior parietal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

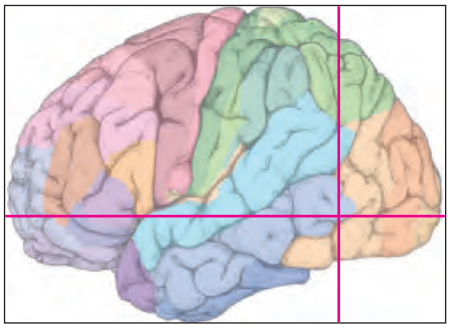
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 81
Slice Nr. 4886

Cortex: Brodmann Areas

81

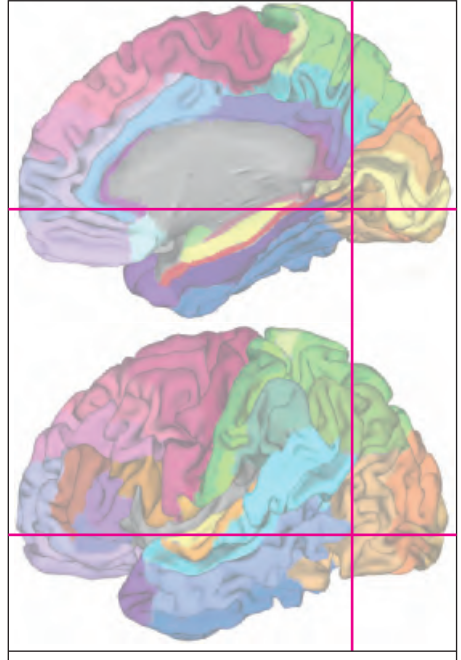
MNI: -67.45
ICL: 64.21
MCP: 49.47



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
spas superior parietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment

spas
ips-h
prculs
sbps
sts-h
acs
ils
cos
lots
its
BA 7
BA 39
BA 31
BA 23
BA 17
BA 18
BA 19
BA 36
BA 22
BA 37
BA 21
1 cm



MNI Position y = -67.53 mm
AHB Position y = 64.30 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA36 area ectorhinalis
BA37 area occipito-temporalis
BA39 area angularis

von Economo and Koskinas

LC1 dorsal posterior cingulate area
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE2 inferior temporal area proper
TF fusiform area
TH hippocampotemporal area

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v23 subregion of BA 23
v31 ventral subregion of BA 31

Cell stain (Nissl):
Section Nr. 81
Slice Nr. 4889

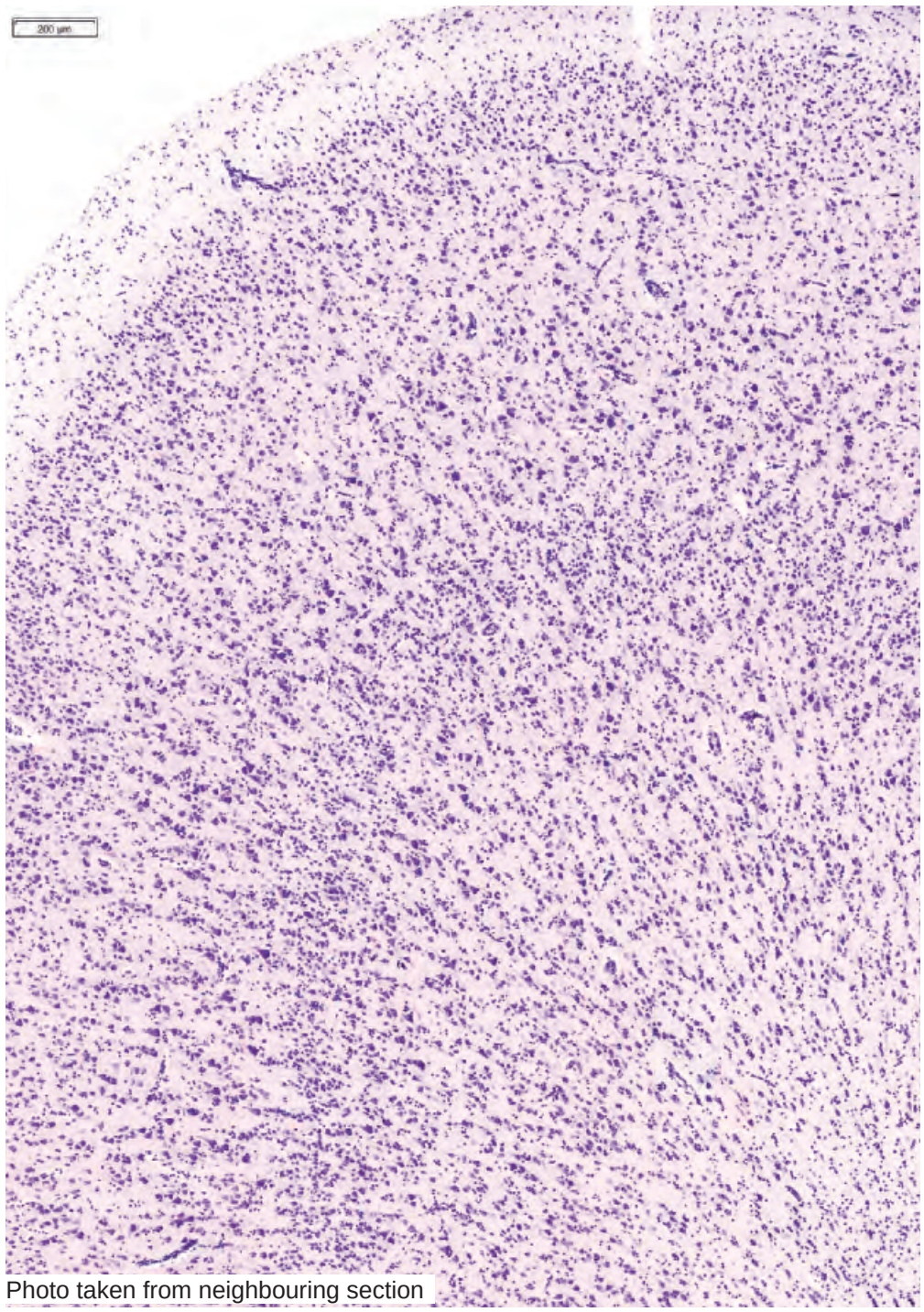
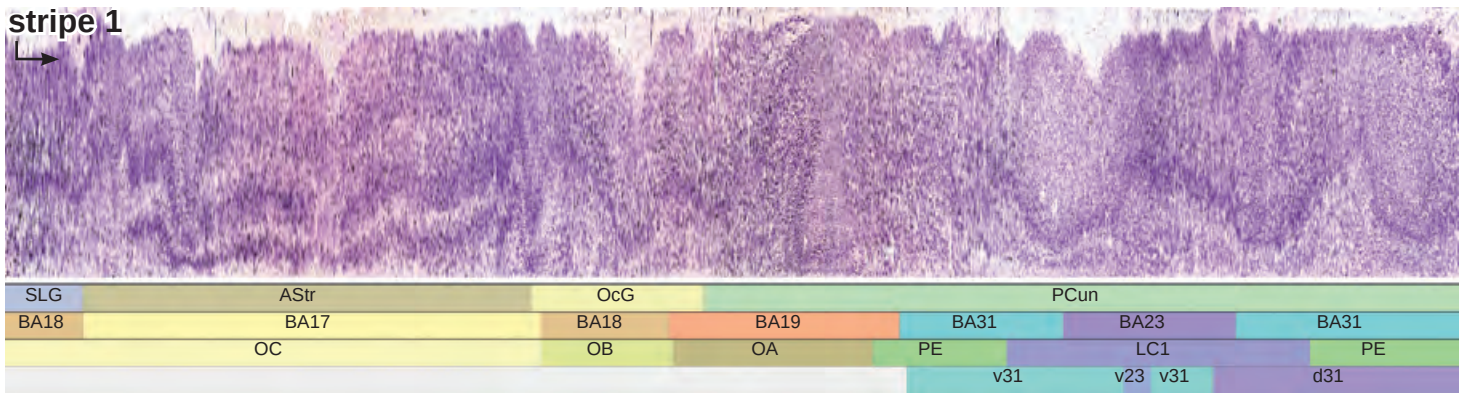
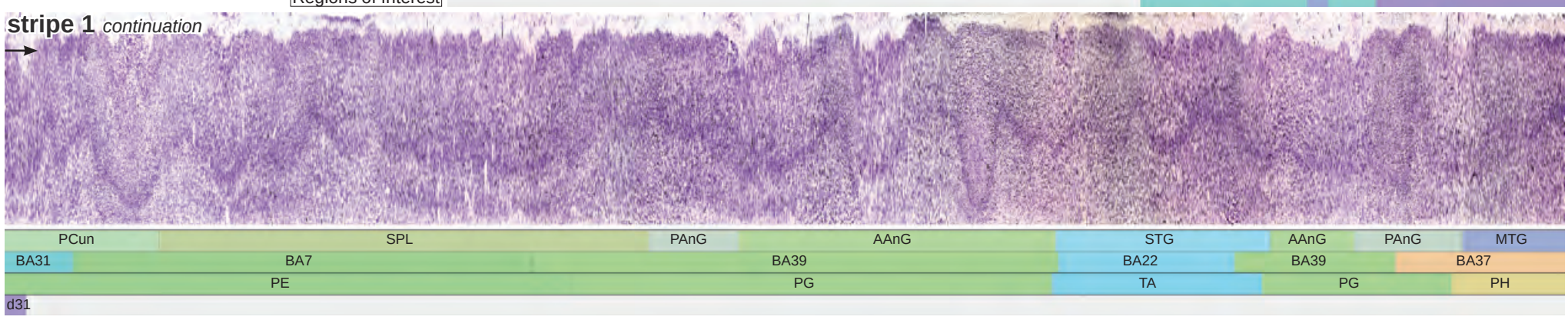


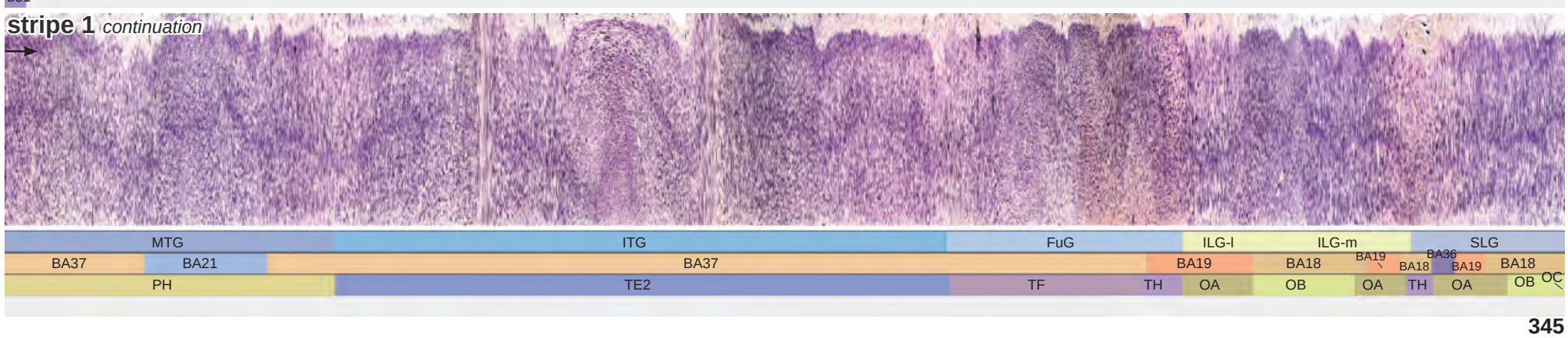
Photo taken from neighbouring section

PG Area angularis.

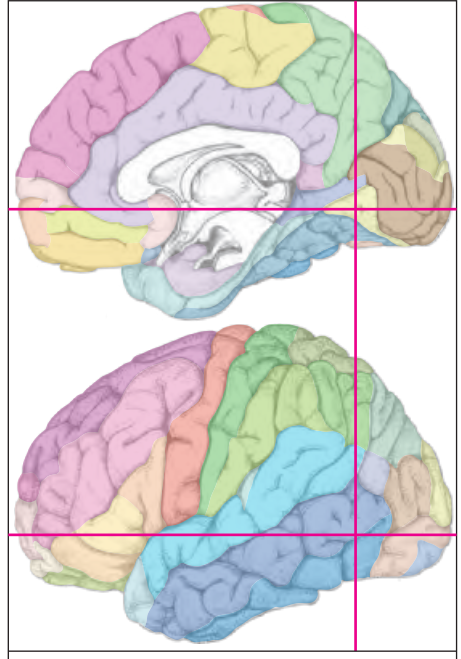
von Economo and Koskinas (1925) Plate LXXVI (76)







Cortex: Gyri and Sulci



MNI Position y = -68.91 mm
AHB Position y = 65.64 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impIII third intermediate parietal sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

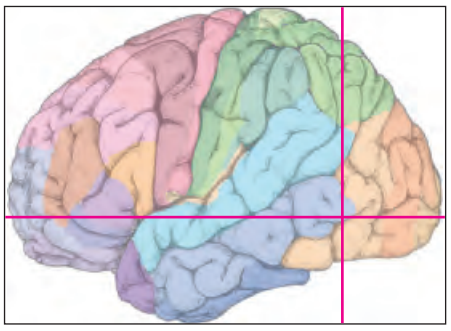
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 82
Slice Nr. 4939

Cortex: Brodmann Areas

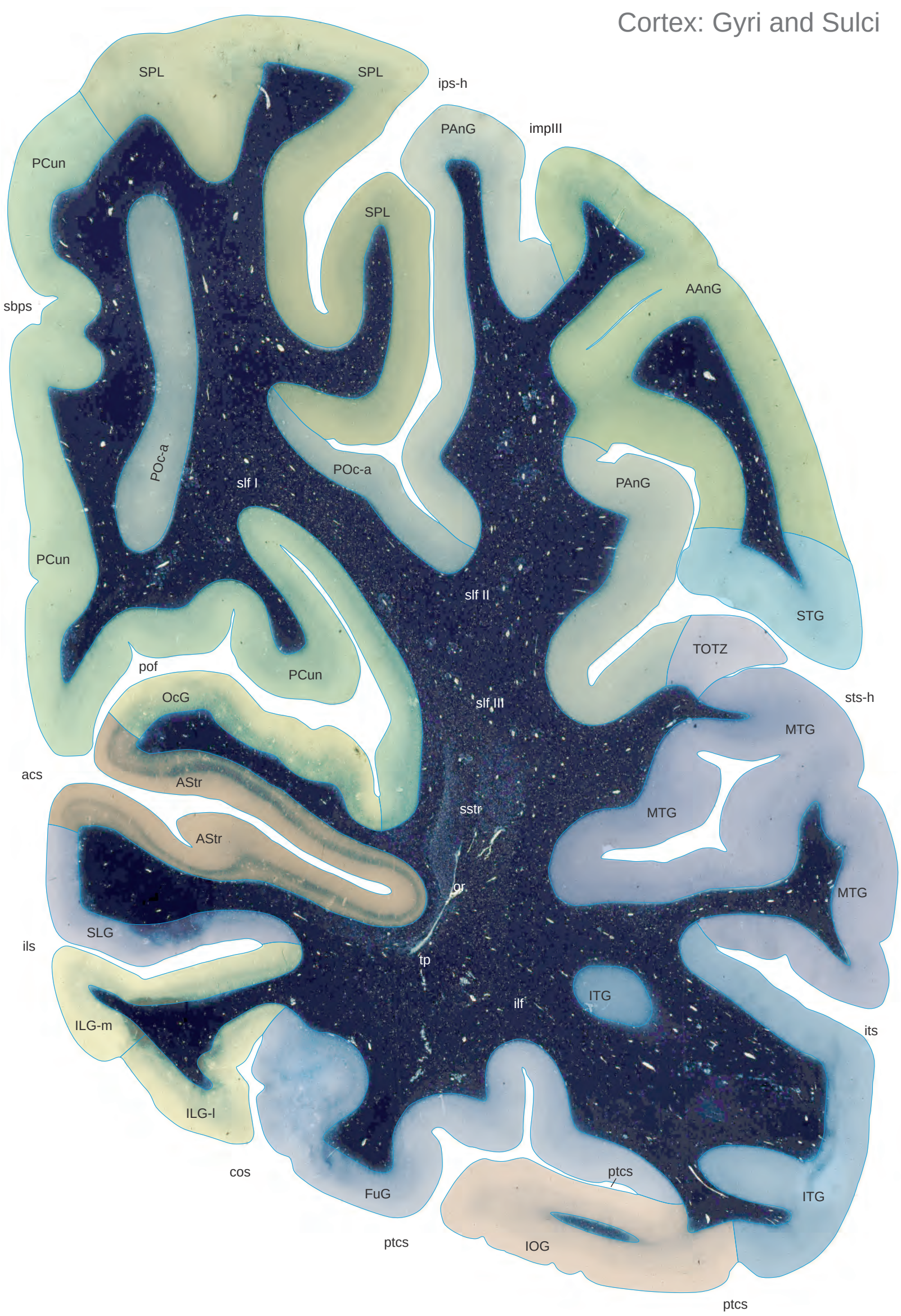
MNI: -68.91
ICL: 65.64
MCP: 50.90

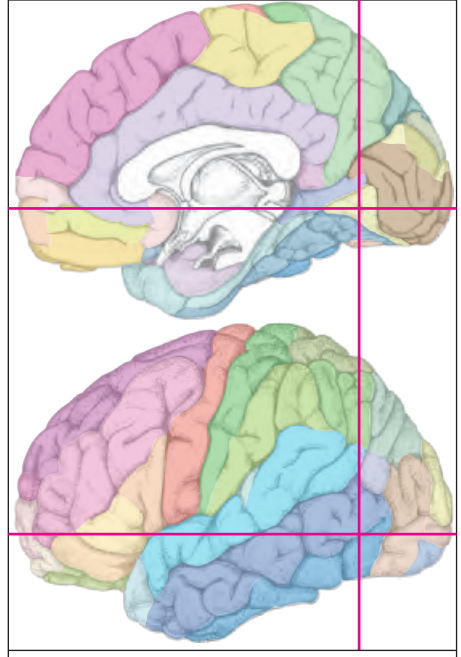


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -70.38 mm
AHB Position y = 67.00 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Sulci

acs calcarine sulcus, anterior part
cos collateral sulcus
ils intralingual sulcus
impIII third intermediate parietal sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

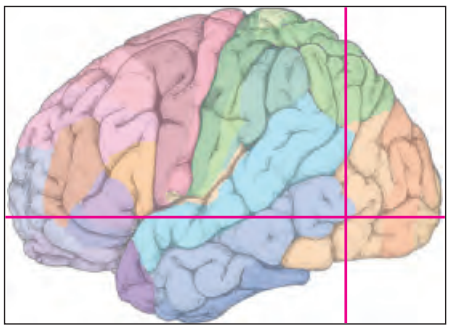
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 83
Slice Nr. 4990

Cortex: Brodmann Areas

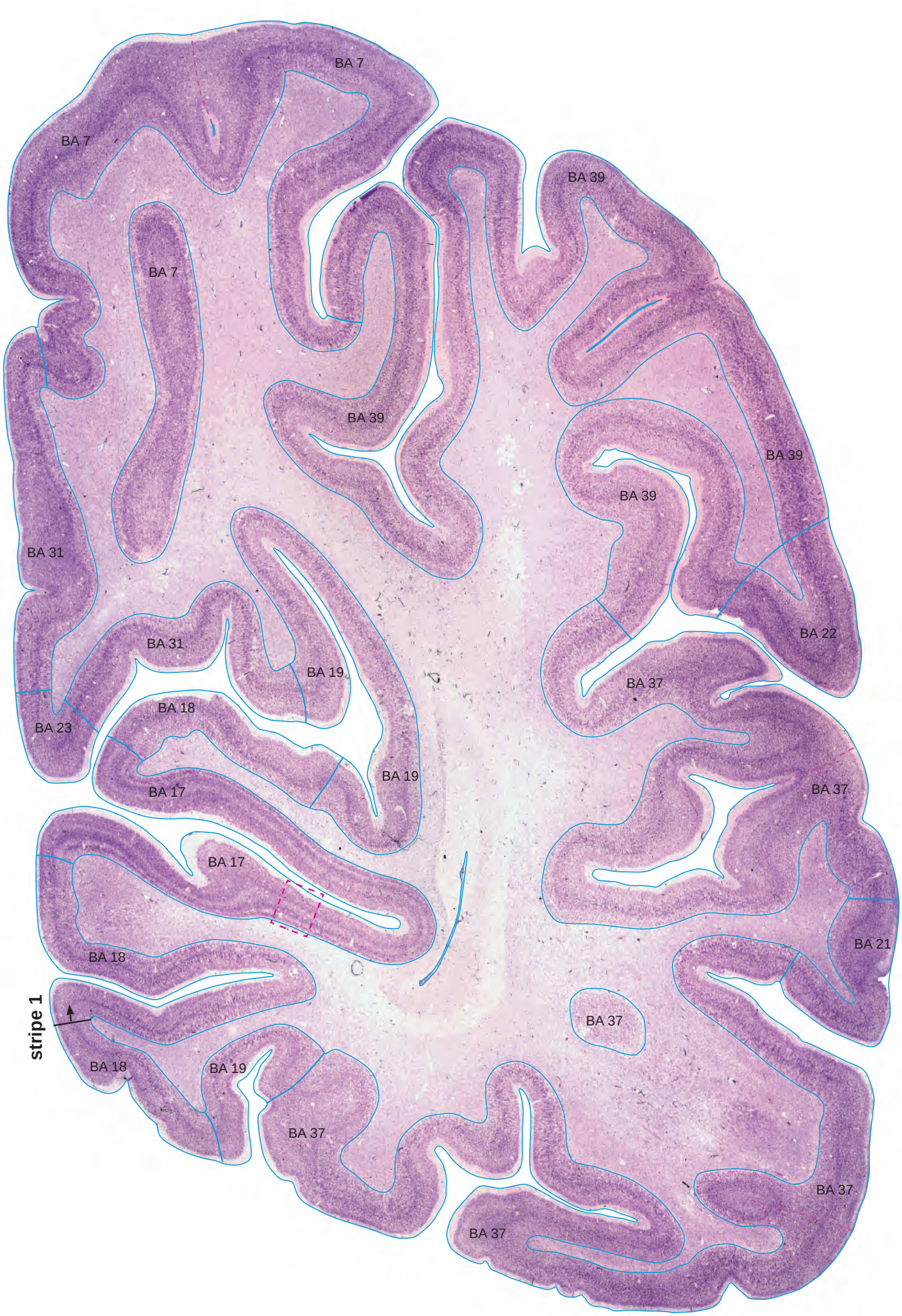
83

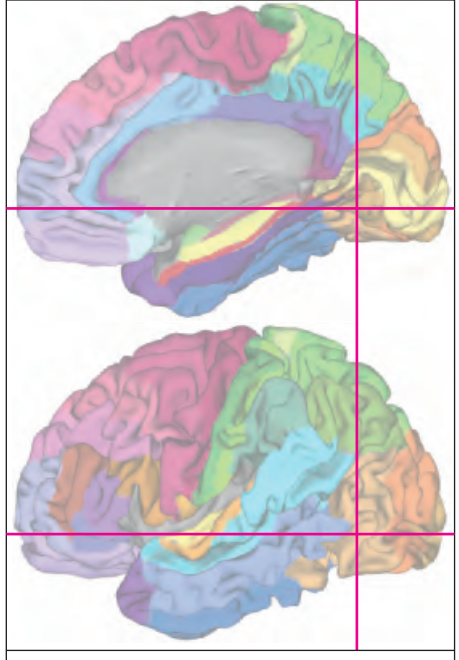
MNI: -70.38
ICL: 67.00
MCP: 52.26



BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -70.29 mm
AHB Position y = 66.92 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA21 area temporalis media
BA22 area temporalis superior
BA23 area cingularis posterior ventralis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis

von Economo and Koskinas

LC1 dorsal posterior cingulate area
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v31 ventral subregion of BA 31

Cell stain (Nissl):
Section Nr. 83
Slice Nr. 4987

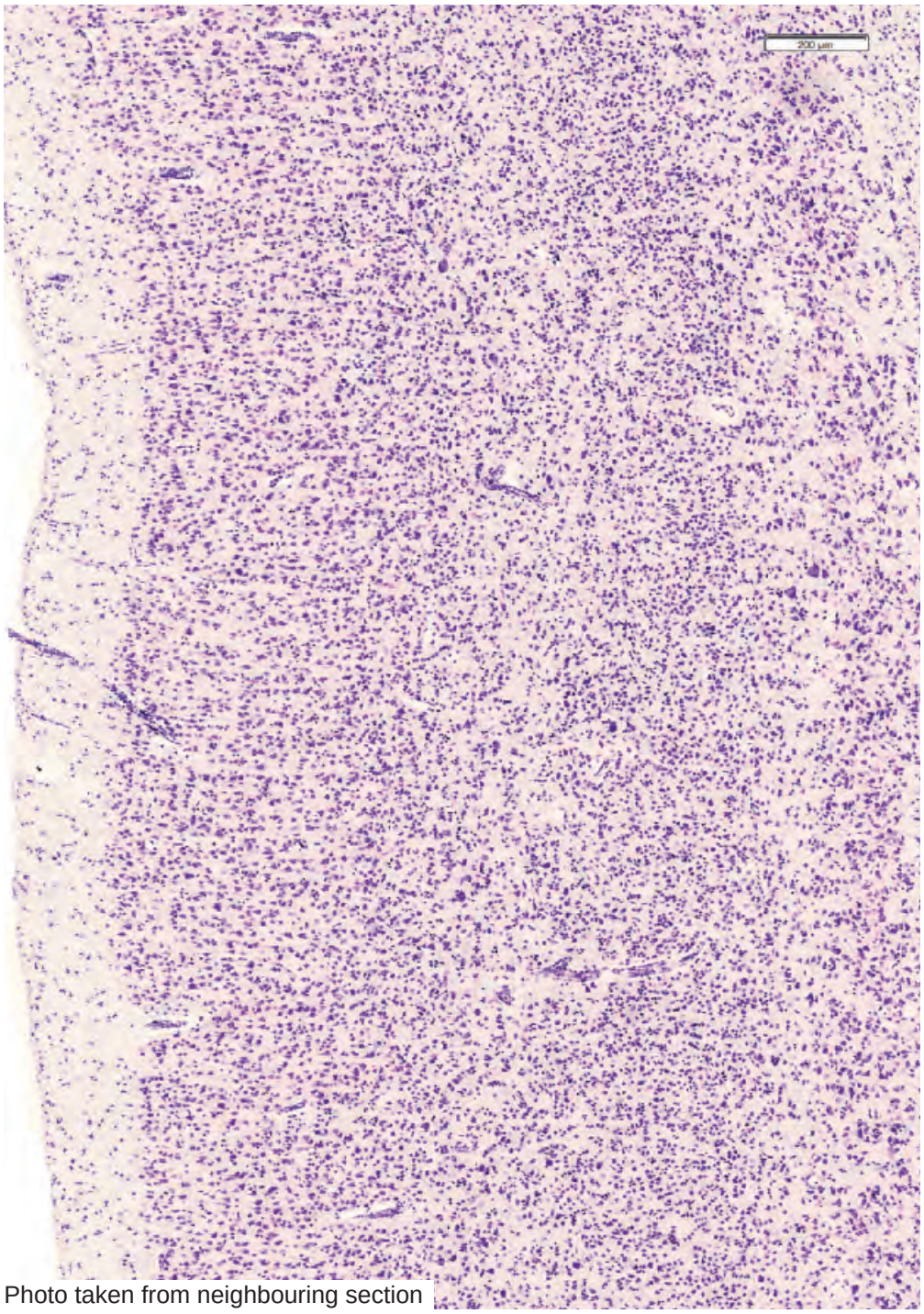
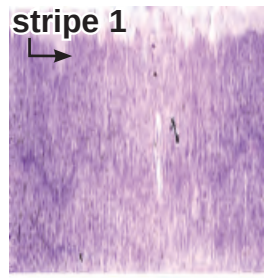
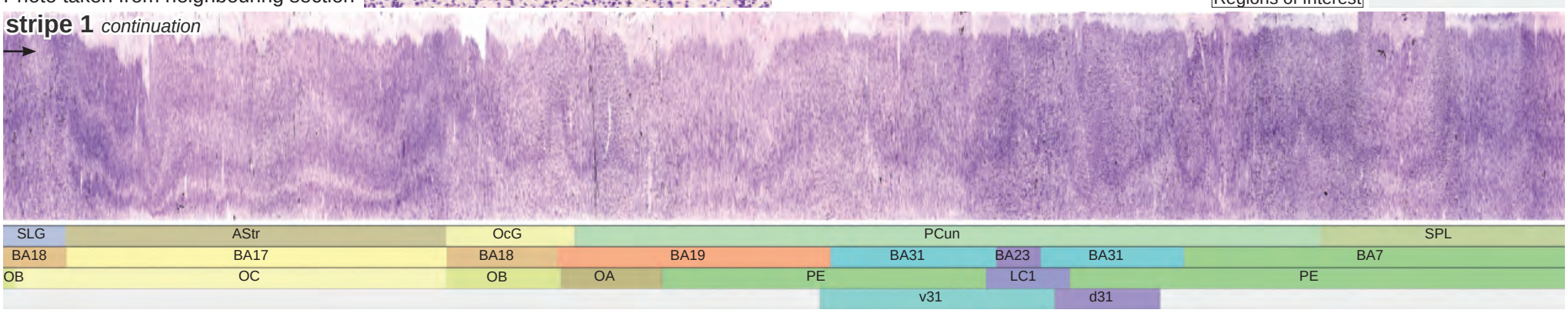


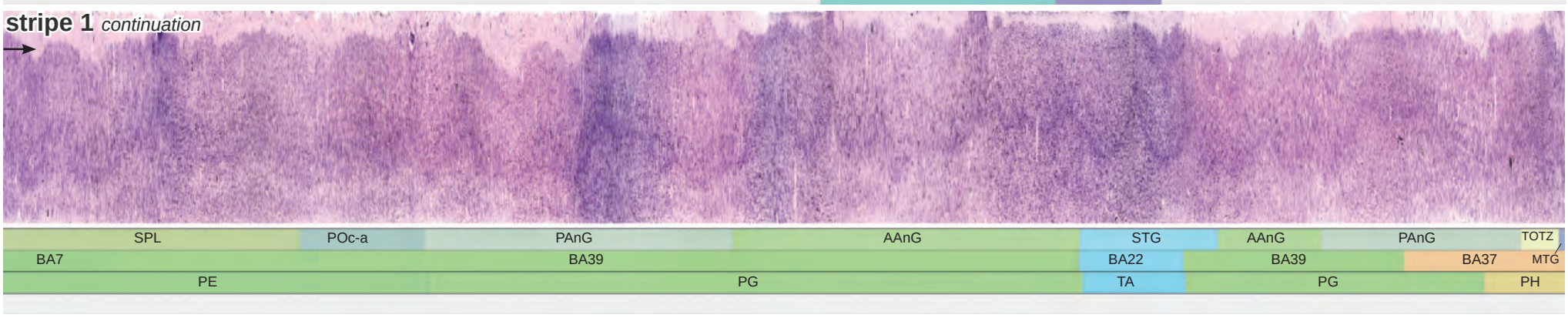
Photo taken from neighbouring section

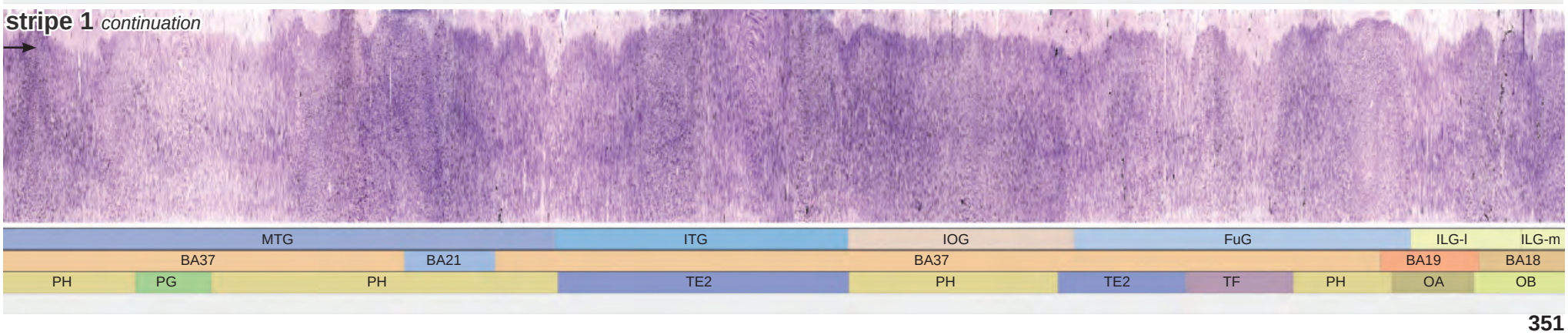
OC Area striata (fundus fissurae calcarinae)

von Economo and Koskinas (1925) Plate LXXXVIII (88a)

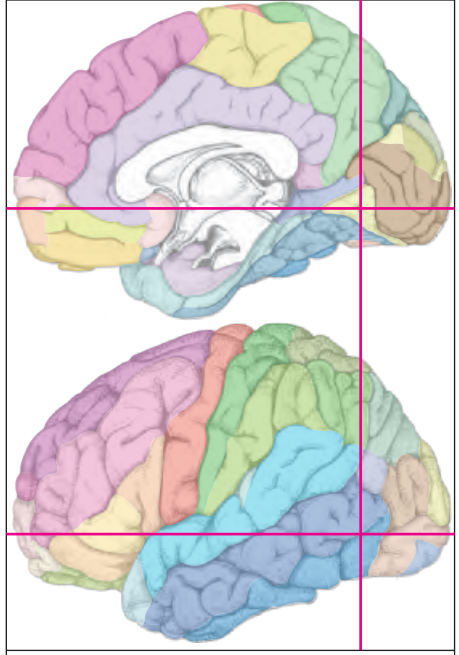








Cortex: Gyri and Sulci



MNI Position y = -71.76 mm
AHB Position y = 68.37 mm

Gyri

*Cp cuneal point
AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Sulci

acs calcarine sulcus, central part
cos collateral sulcus
ils intralingual sulcus
impIII third intermediate parietal sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

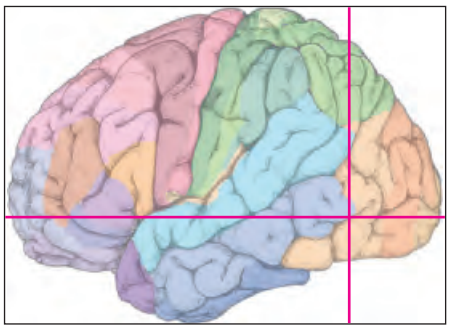
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 84
Slice Nr. 5041

Cortex: Brodmann Areas

84

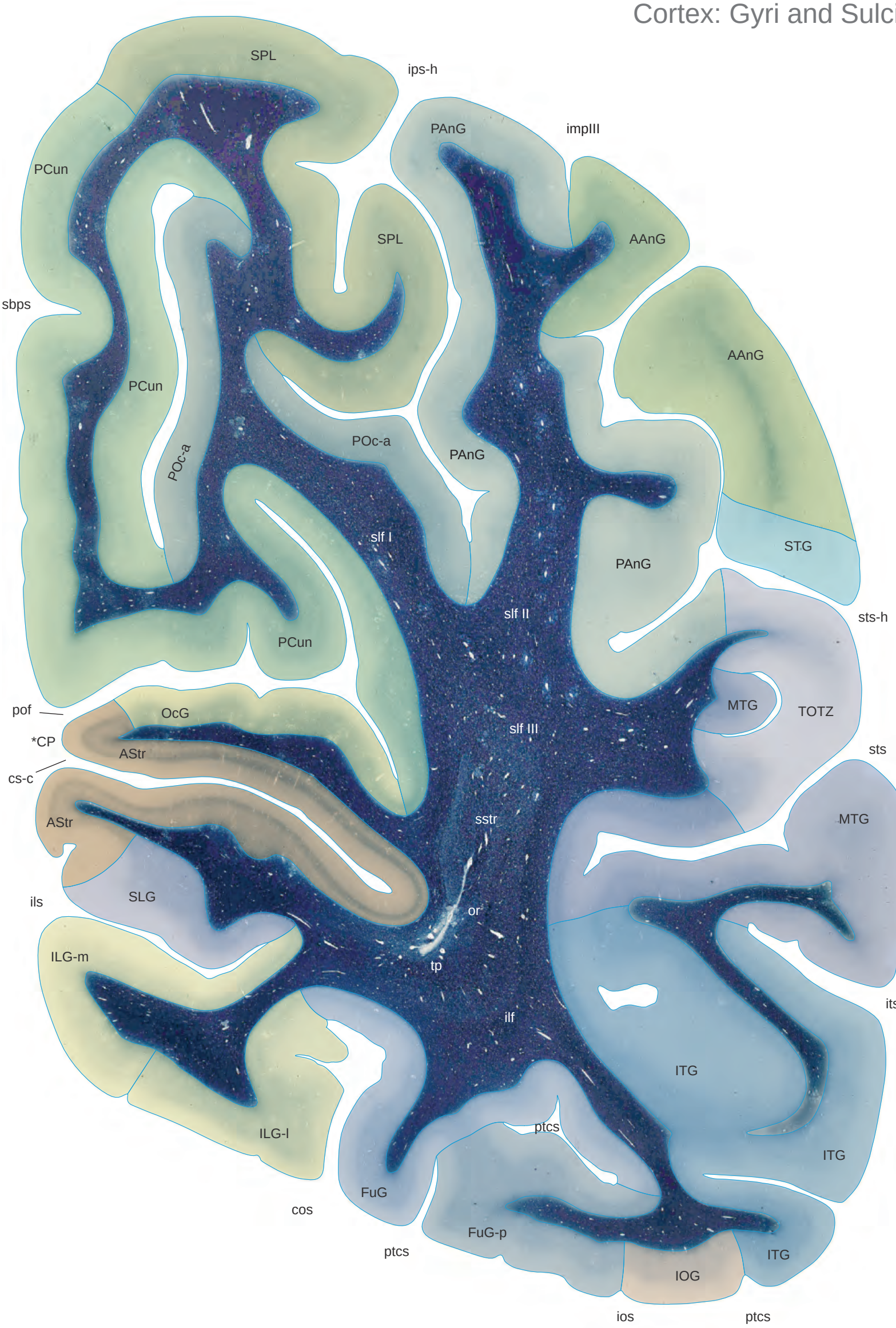
MNI: -71.76
ICL: 68.37
MCP: 53.63

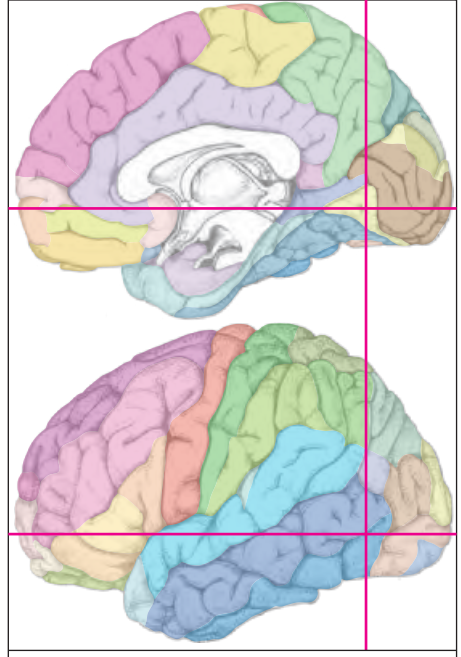


BA1-52 Brodmann areas 1-52 (see p. 101)

acs anterior calcarine sulcus
cos collateral sulcus
ils intralingual sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -73.19 mm
AHB Position y = 69.68 mm

Gyri

*CP cuneal point
AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Sulci

cos collateral sulcus
cs-c calcarine sulcus, central part
ils intralingual sulcus
impIII third intermediate parietal sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

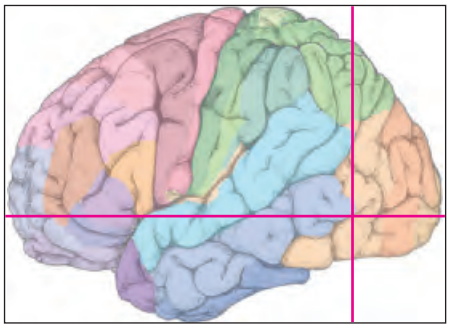
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 85
Slice Nr. 5090

Cortex: Brodmann Areas

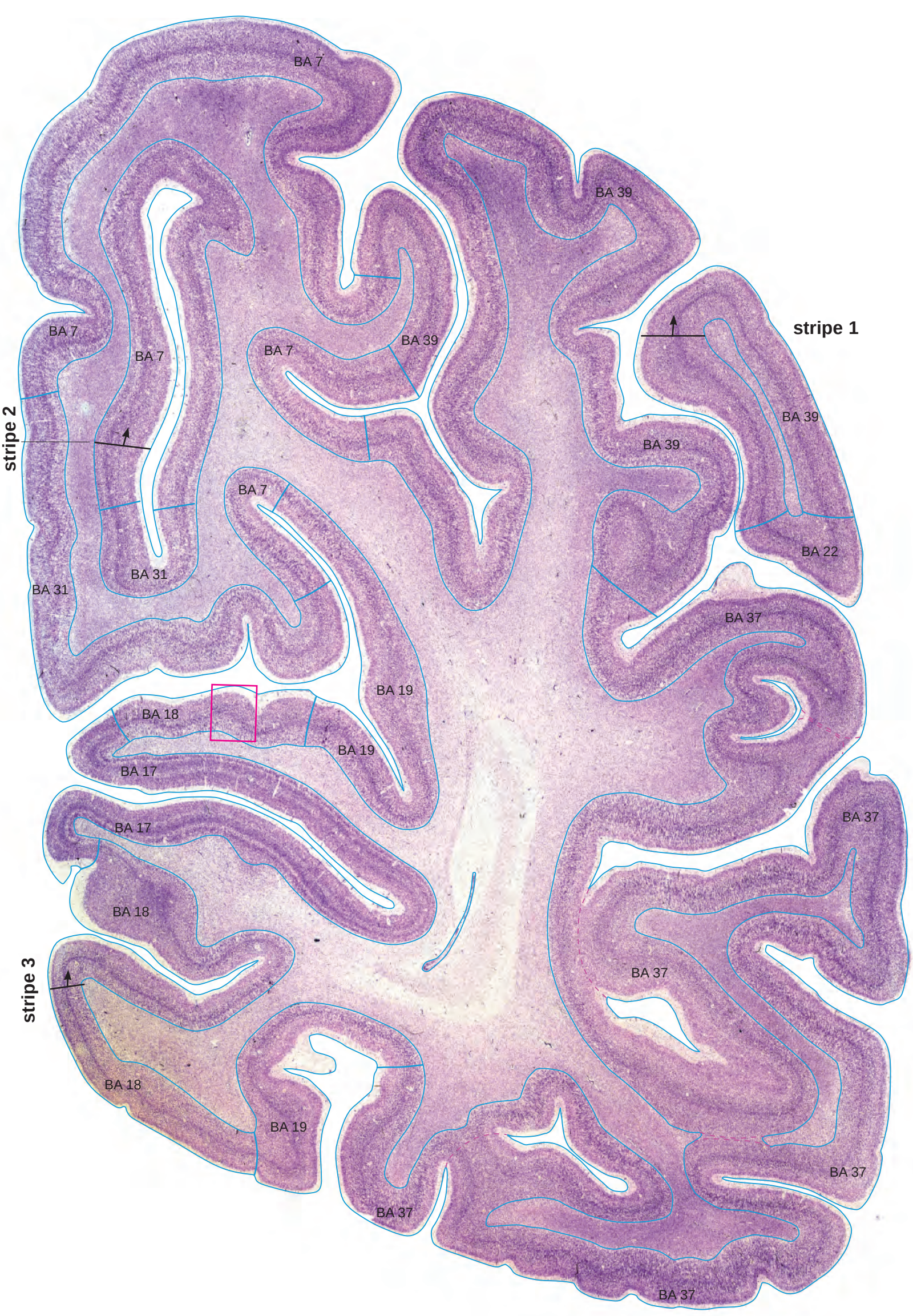
85

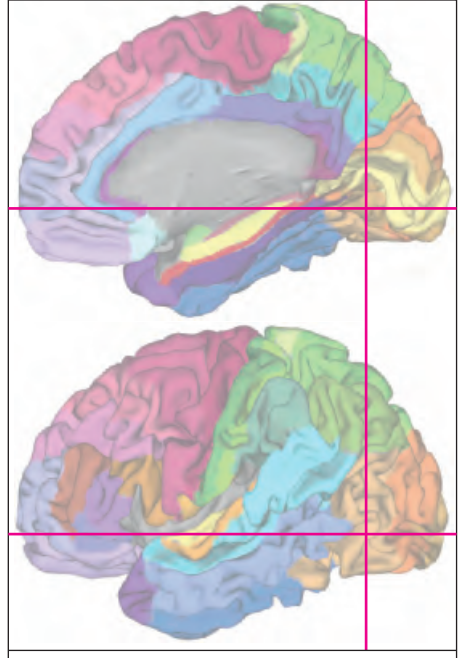
MNI: -73.19
ICL: 69.68
MCP: 54.94



BA1-52 Brodmann areas 1-52 (see p. 101)

cos collateral sulcus
cs-c calcarine sulcus, central p.
ils intralingual sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -73.22 mm
AHB Position y = 69.71 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
CuP cuneal point
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA22 area temporalis superior
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA38 area temporopolaris
BA39 area angularis

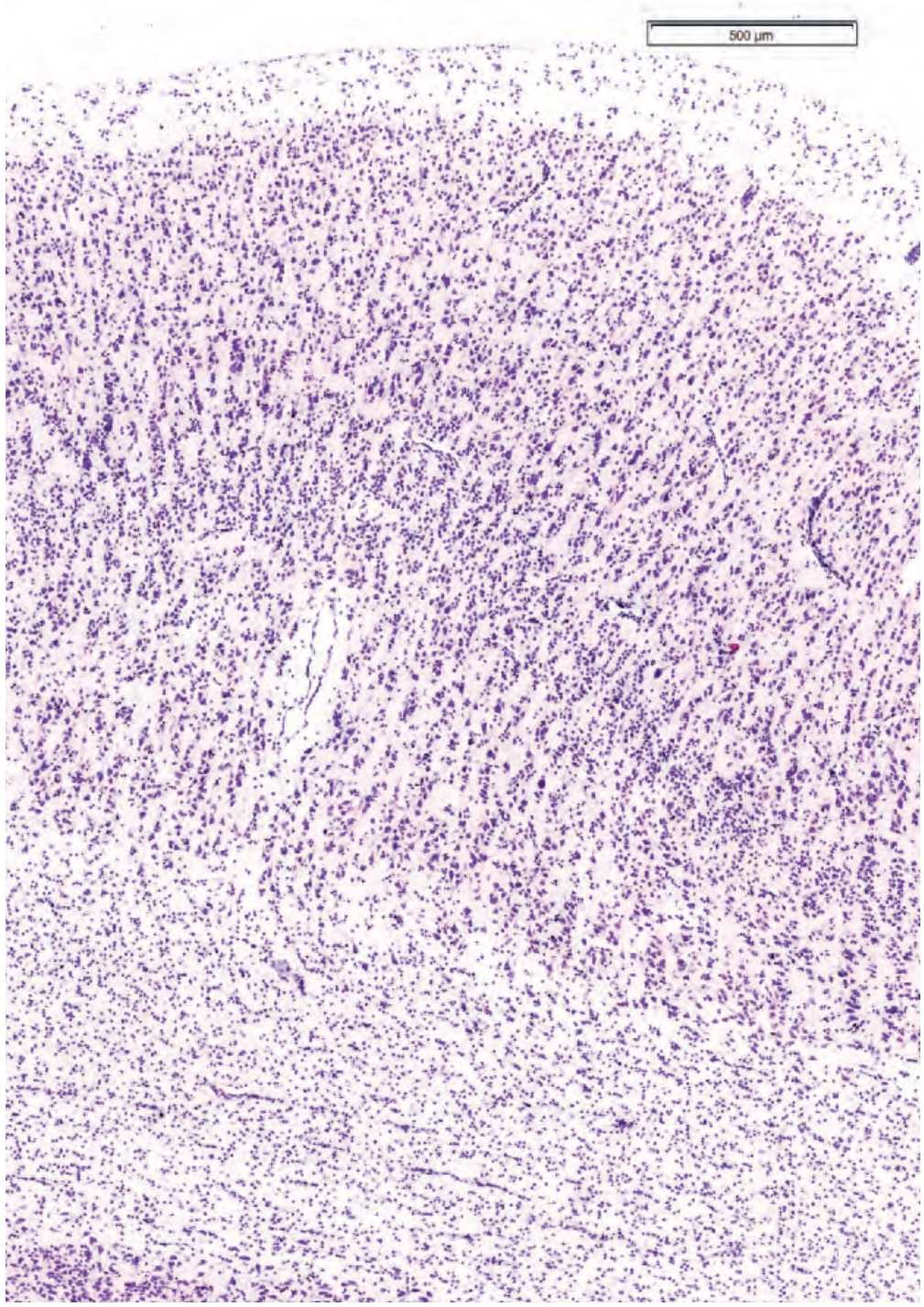
von Economo and Koskinas

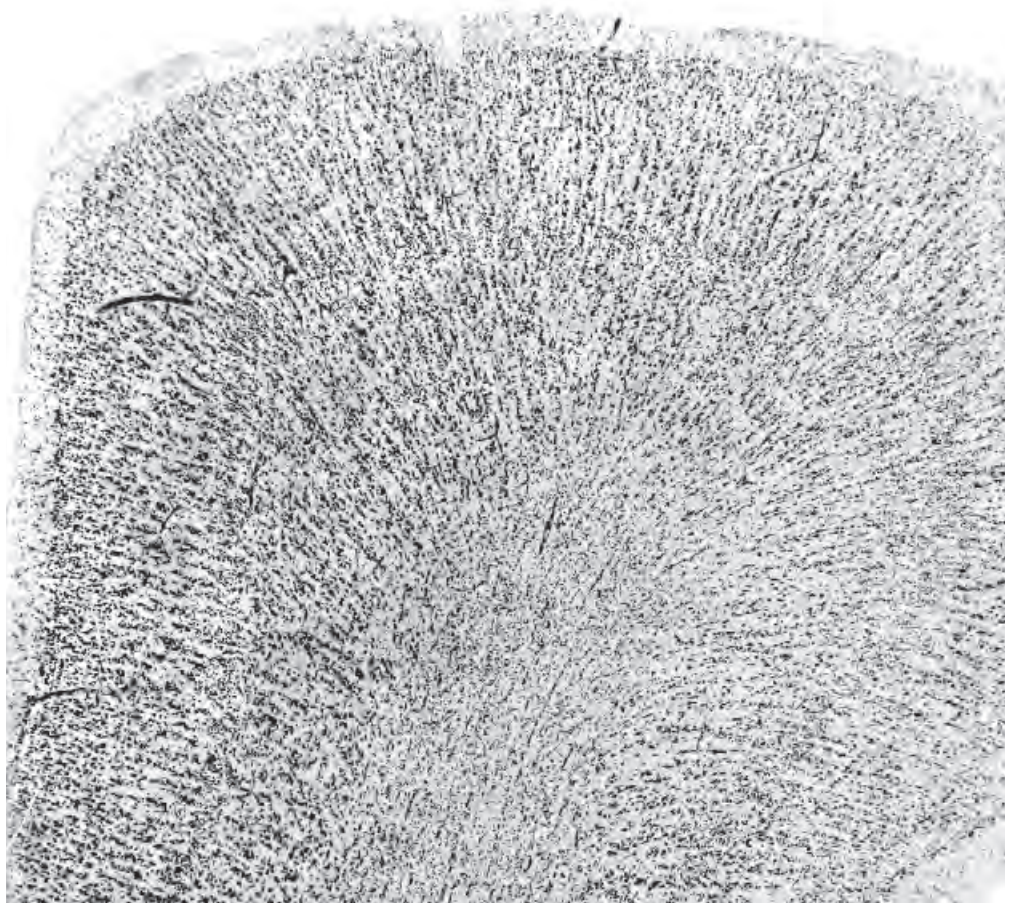
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area
TA superior temporal area
TE2 inferior temporal area proper
TF fusiform area

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v31 ventral subregion of BA 31

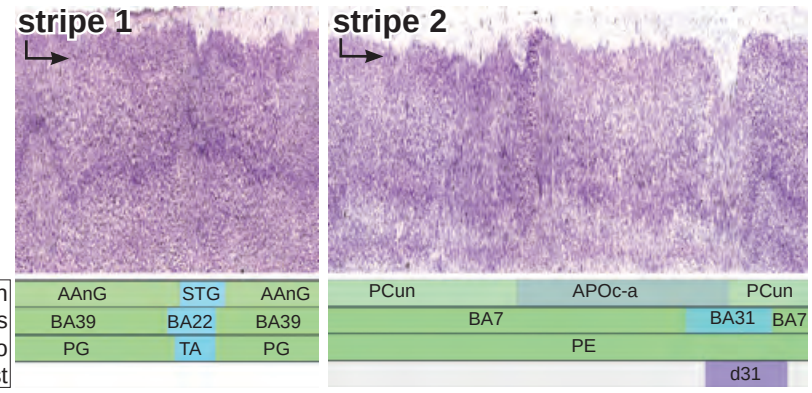
Cell stain (Nissl):
Section Nr. 85
Slice Nr. 5091

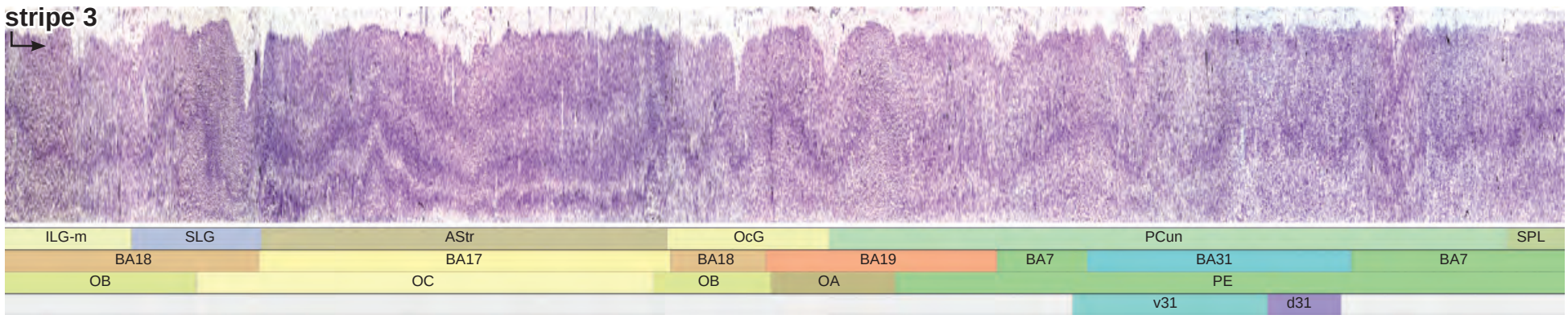


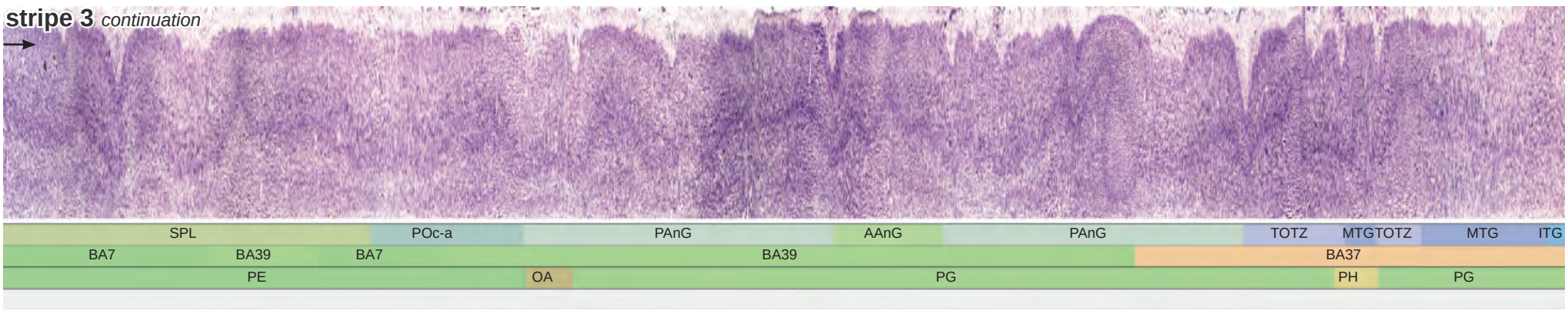


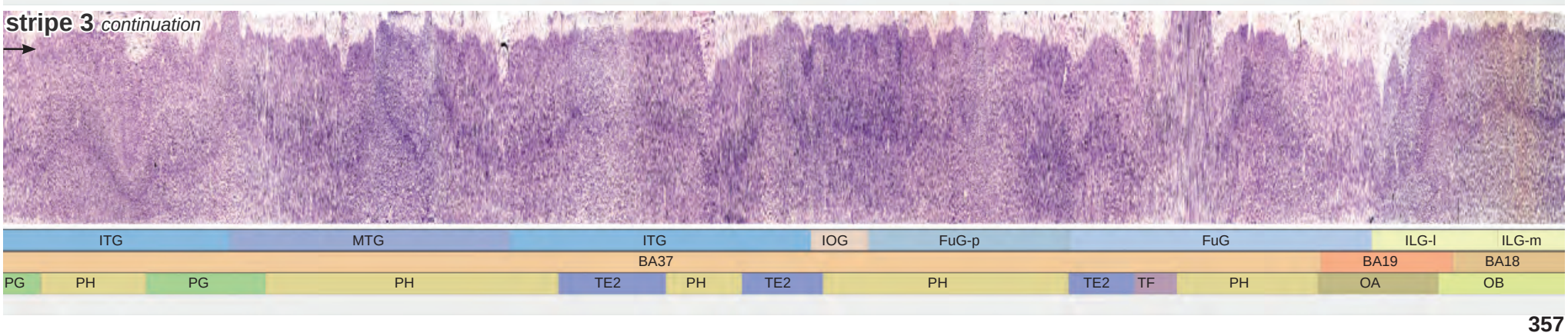
Cunei gyrus sagittalis medius; OA1 Area peristriata.

von Economo and Koskinas (1925) Plate LXXXIII (83)

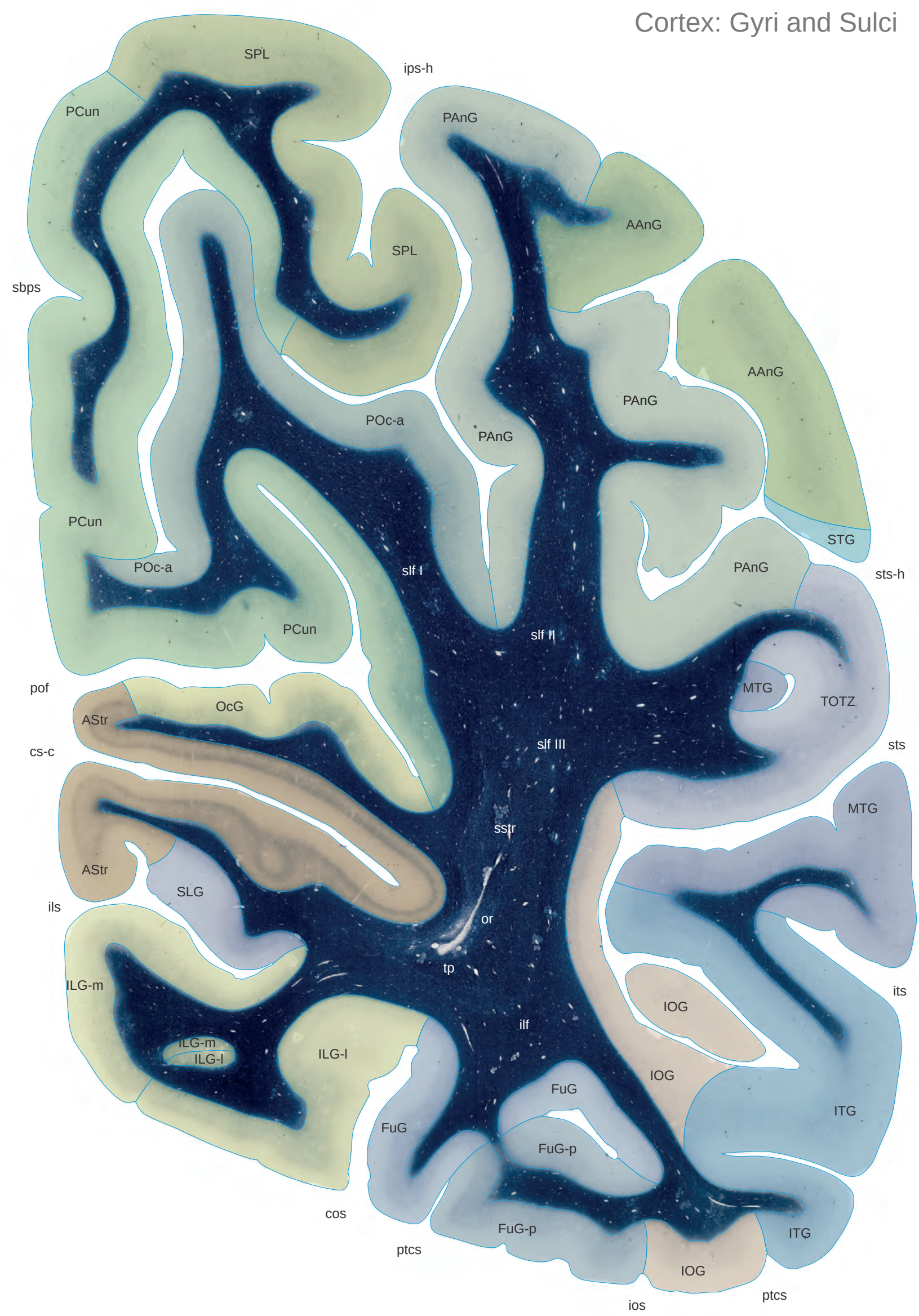


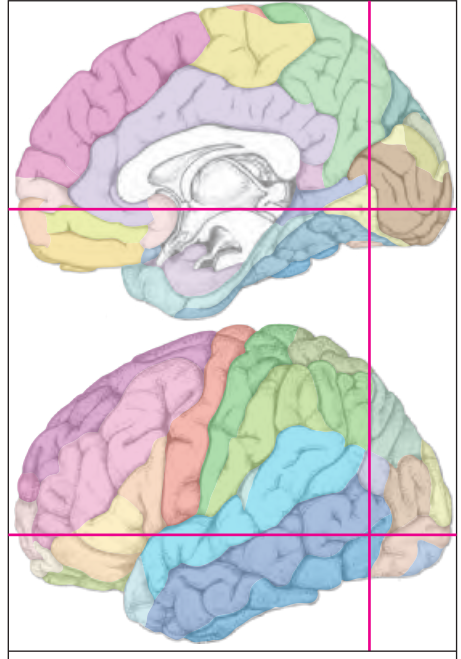






Cortex: Gyri and Sulci





MNI Position y = -74.57 mm
AHB Position y = 71.00 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone

Sulci

cos collateral sulcus
cs-c calcarine sulcus, central part
cs-c calcarine sulcus, central part
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

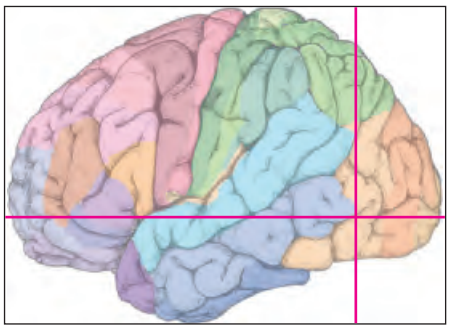
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 86
Slice Nr. 5139

Cortex: Brodmann Areas

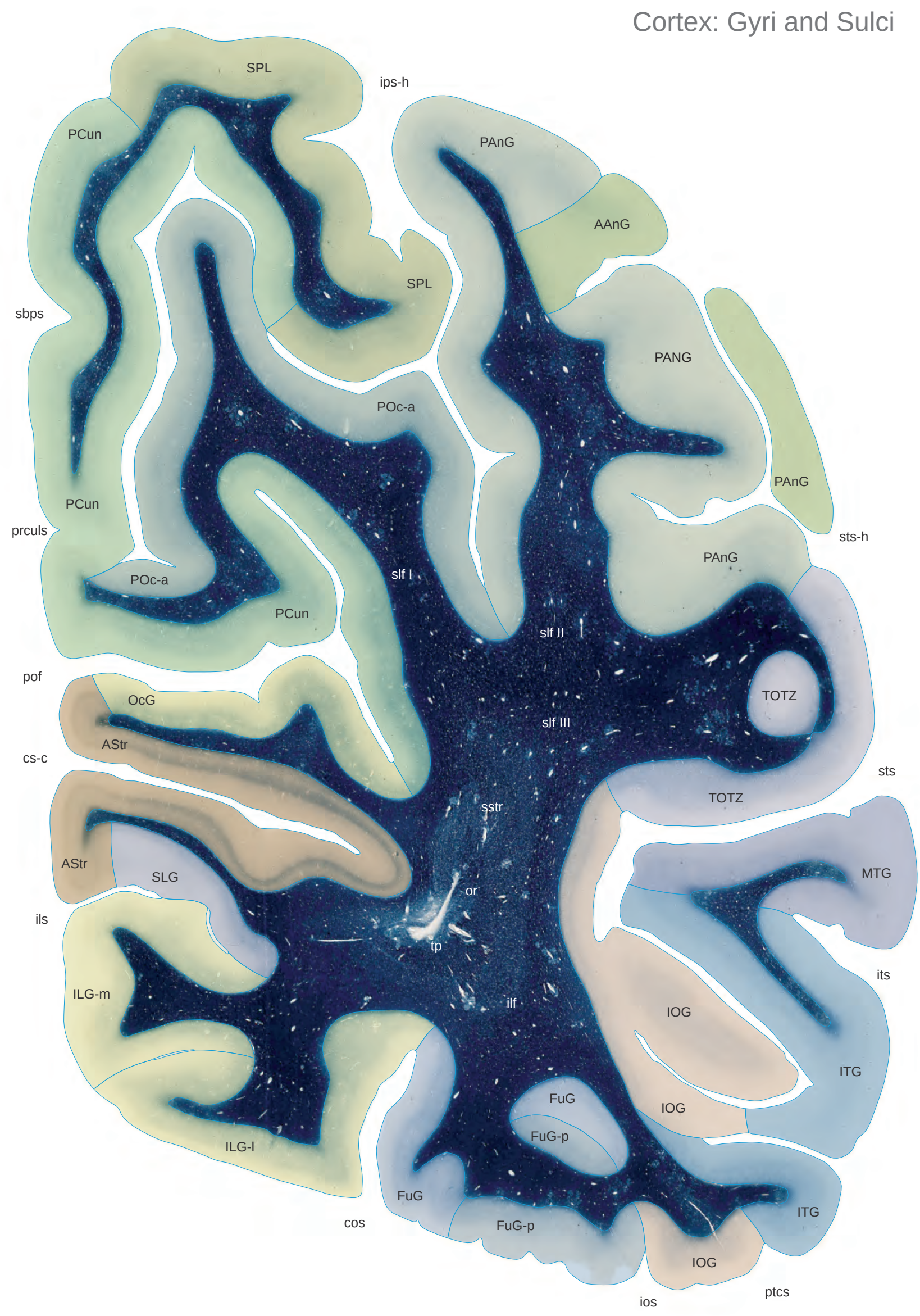
MNI: -74.57
ICL: 71.00
MCP: 56.26

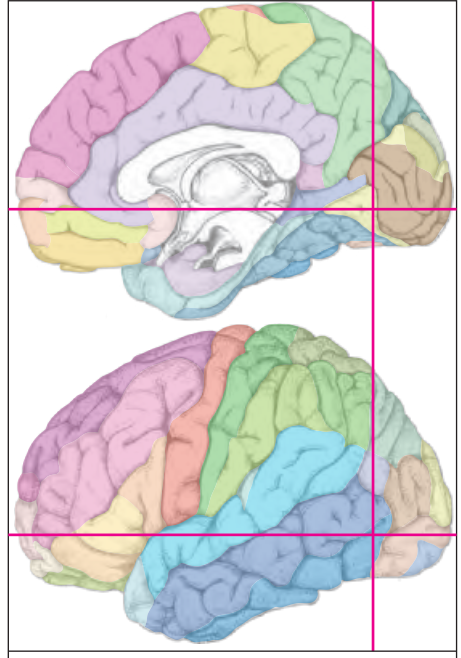


BA1-52 Brodmann areas 1-52 (see p. 101)

cos collateral sulcus
cs-c calcarine sulcus, central p.
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
lots lateral occipitotemporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -76.04 mm
AHB Position y = 72.39 mm

Gyri

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Sulci

cos collateral sulcus
cs-c calcarine sulcus, central part
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

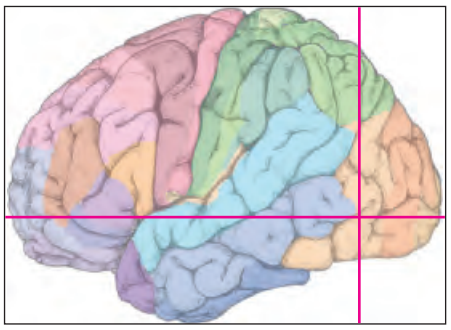
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 87
Slice Nr. 5191

Cortex: Brodmann Areas

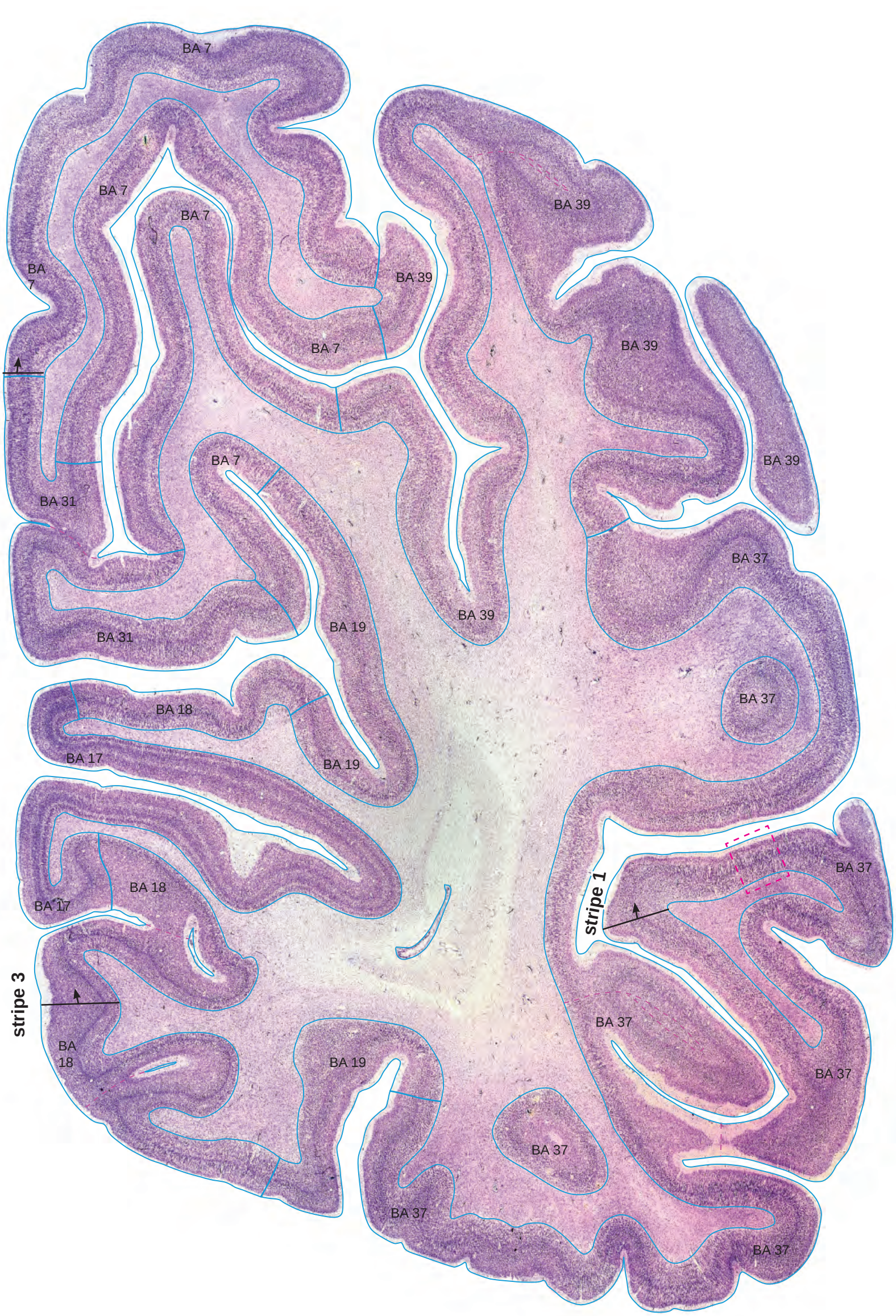
87

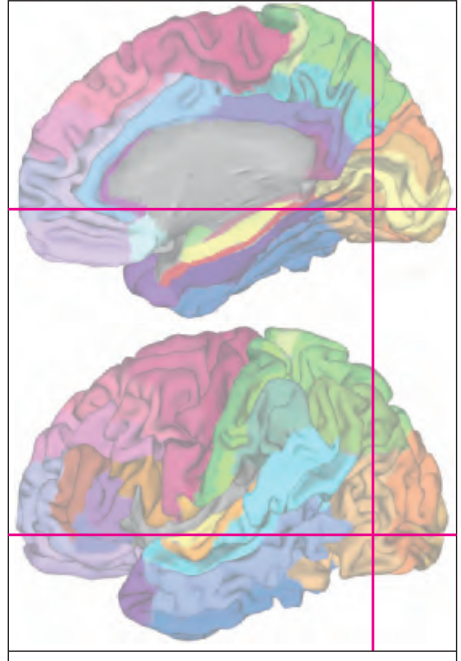
MNI: -76.04
ICL: 72.39
MCP: 57.65



BA1-52 Brodmann areas 1-52 (see p. 101)

cos collateral sulcus
cs-c calcarine sulcus, central p.
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal posterior segment





MNI Position y = -76.01 mm
AHB Position y = 72.36 mm

Gyral Pattern

AAnG angular gyrus
AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis

von Economo and Koskinas

OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area
TE2 inferior temporal area proper

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v31 ventral subregion of BA 31

Cell stain (Nissl):
Section Nr. 87
Slice Nr. 5190

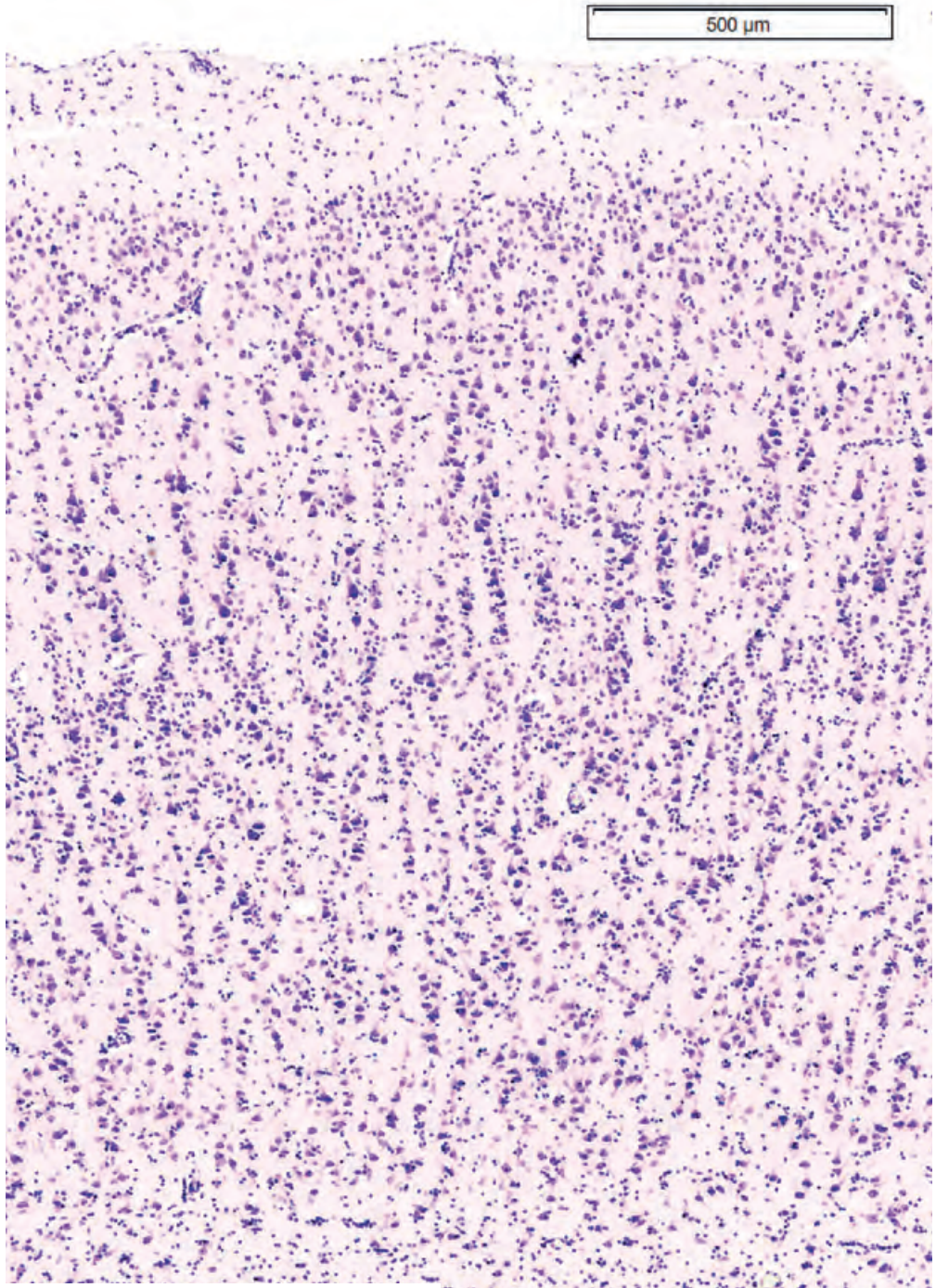
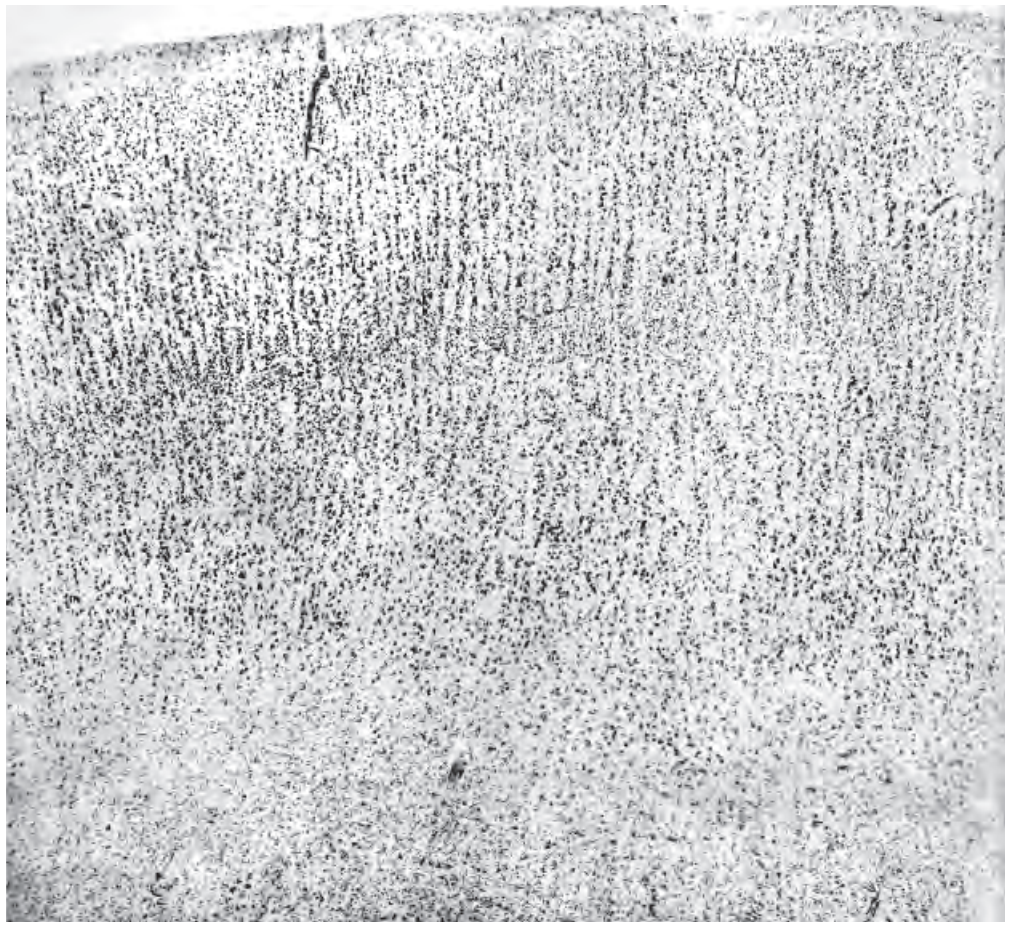
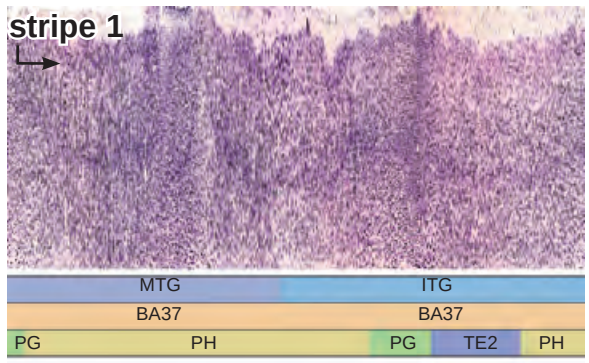


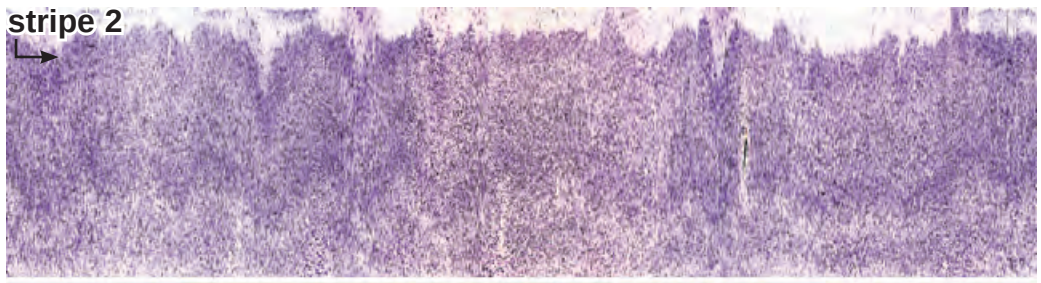
Photo taken from neighbouring section

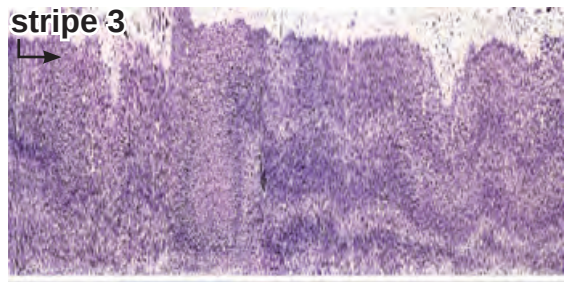


PHO Area parietalis basalis in limine occipitali.

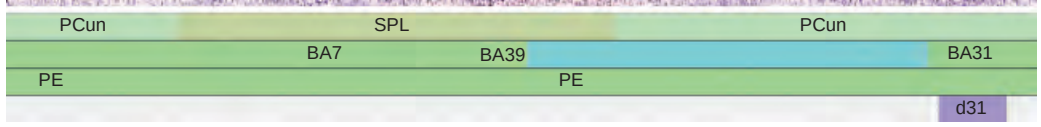
von Economo and Koskinas (1925) Plate LXXIX (79)

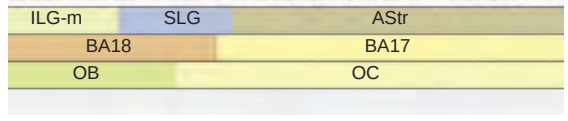


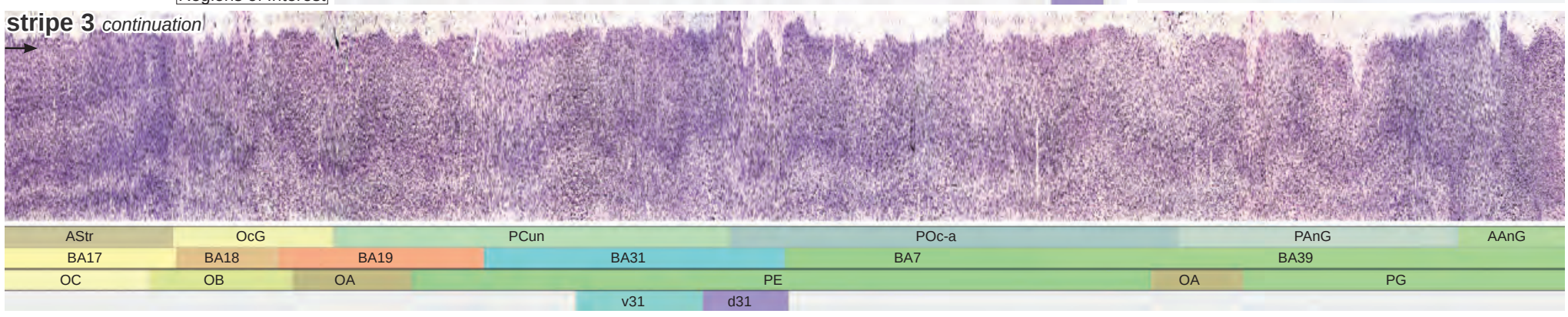


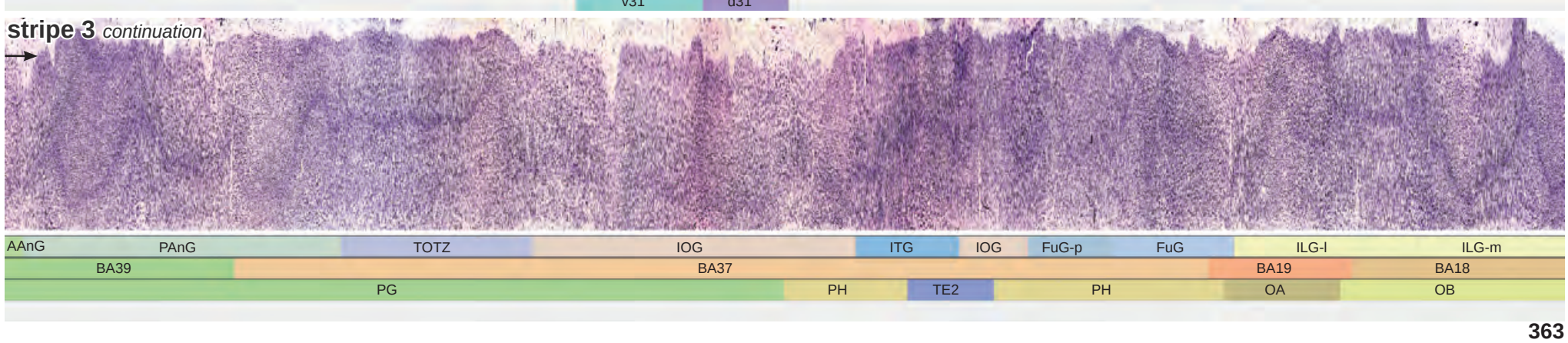


Gyral pattern
Brodmann areas
von Economo
Regions of Interest

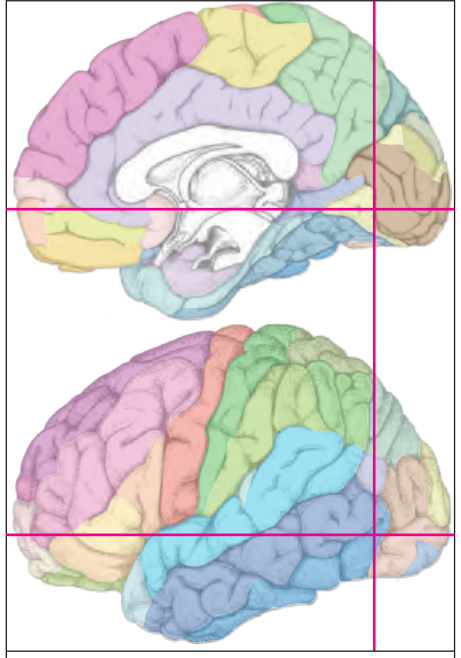








Cortex: Gyri and Sulci



MNI Position y = -77.42 mm
AHB Position y = 73.62 mm

Gyri

AStr striate area
AAnG anterior angular gyrus
FuG fusiform gyrus
FuG-p fusiform gyrus, posterior part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
POc-a Arcus parieto-occipitalis, ant. division
SLG superior lingual gyrus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Sulci

angs angular sulcus
cos collateral sulcus
cs-c calcarine sulcus, central part
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal segment (sts-2)

Fibers

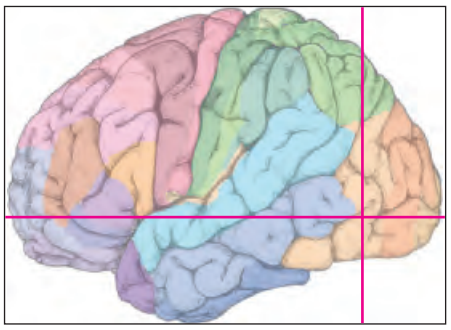
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 88
Slice Nr. 5237

Cortex: Brodmann Areas

88

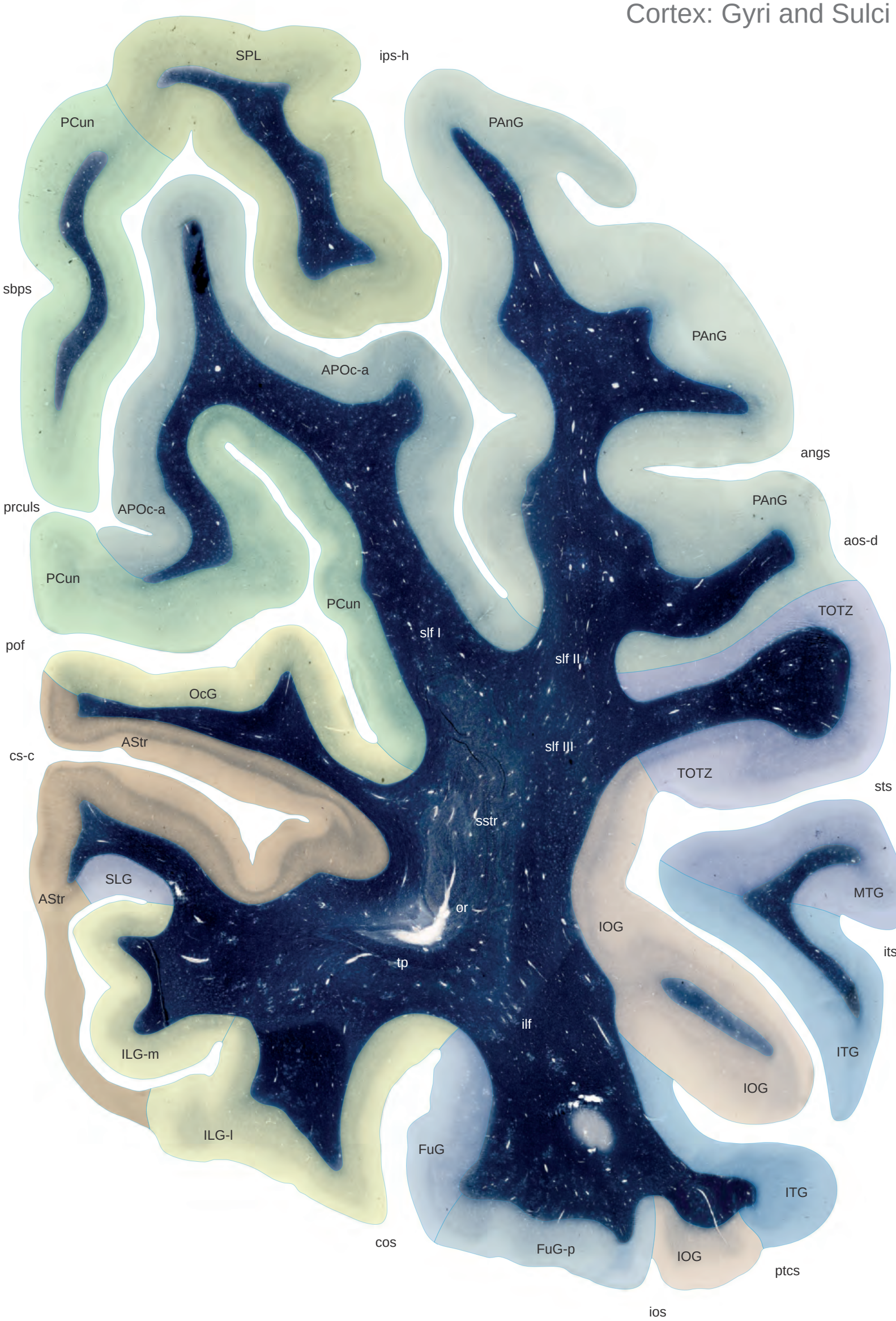
MNI: -77.42
ICL: 73.62
MCP: 58.88

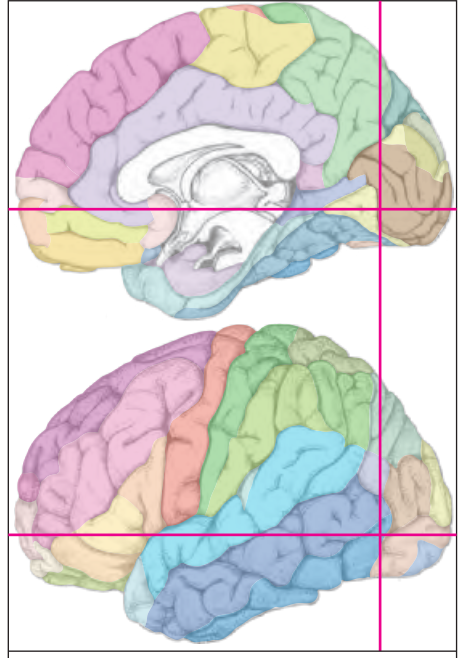


BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
cos collateral sulcus
cs-c calcarine sulcus, central p.
ils intralingual sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts superior temporal sulcus
sts-h superior temporal sulcus, horizontal posterior segment

Cortex: Gyri and Sulci





MNI Position y = -78.77 mm
AHB Position y = 75.12 mm

Gyri

AStr striate area
APOc-a Arcus parieto-occipitalis, ant. division
FuG fusiform gyrus
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Sulci

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central part
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
ptcs posterior transverse collateral sulcus
prculs precuneal limiting sulcus
sbps subparietal sulcus
sts superior temporal sulcus

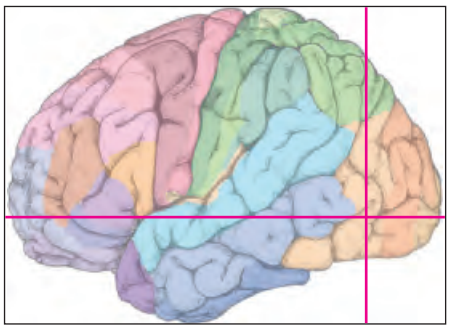
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 89
Slice Nr. 5293

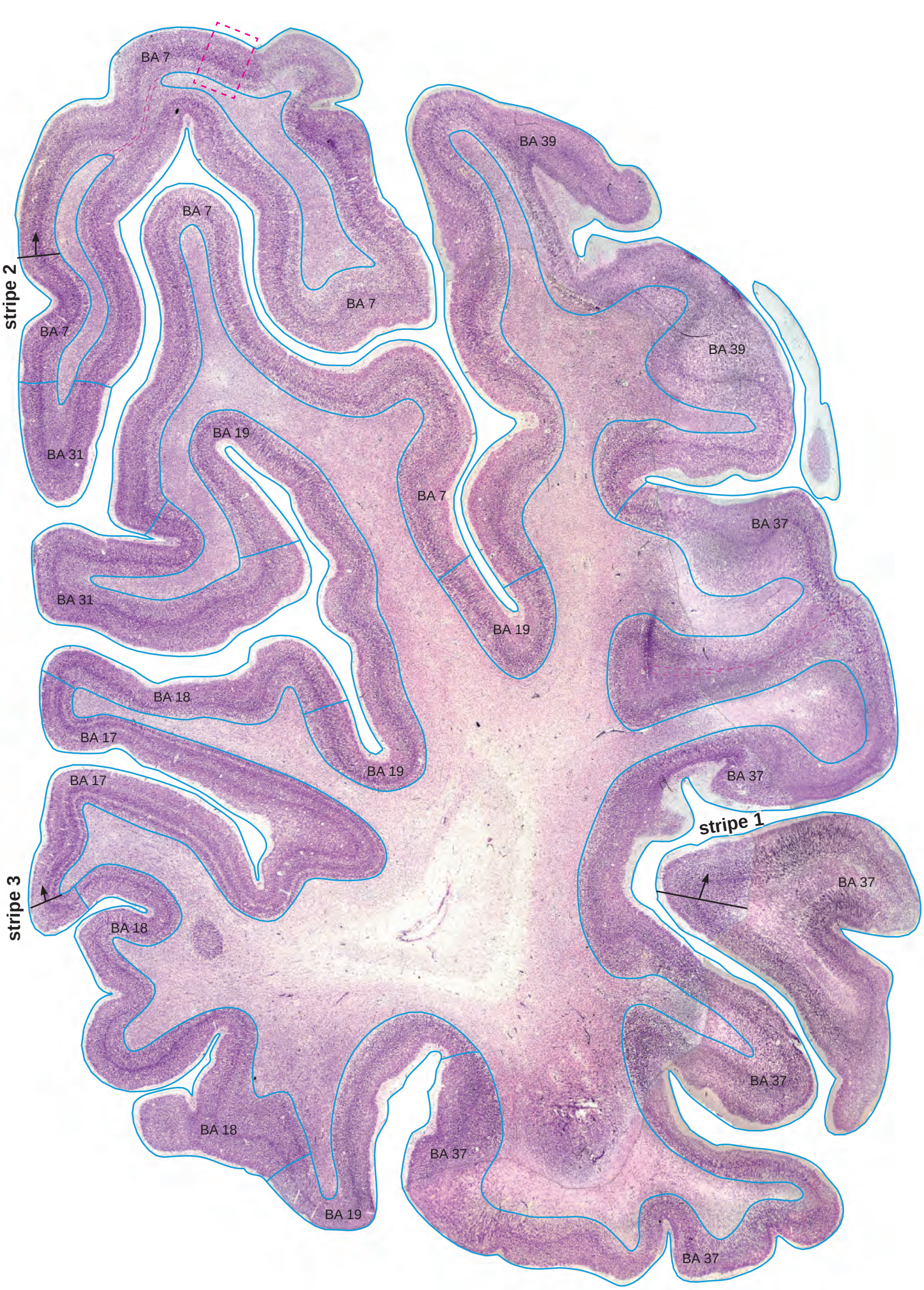
Cortex: Brodmann Areas

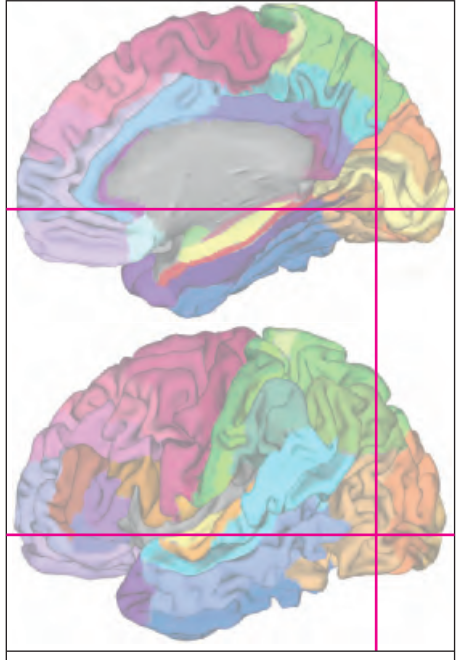
MNI: -78.77
ICL: 75.12
MCP: 60.38



BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central p.
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
ptcs posterior transverse collateral sulcus
sbps subparietal sulcus
sts superior temporal sulcus





MNI Position y = -78.12 mm
AHB Position y = 74.37 mm

Gyral Pattern

AStr striate area
APOc-a Arcus parieto-occipitalis, ant. division
FuG fusiform gyrus
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MTG middle temporal gyrus
OcG occipital gyri
PAnG posterior angular gyrus
PCun precuneus
SLG superior lingual gyrus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis

von Economo and Koskinas

OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area

Regions of Interest

B. Vogt:
d31 dorsal subregion of BA 31
v31 ventral subregion of BA 31

Cell stain (Nissl):
Section Nr. 89
Slice Nr. 5265

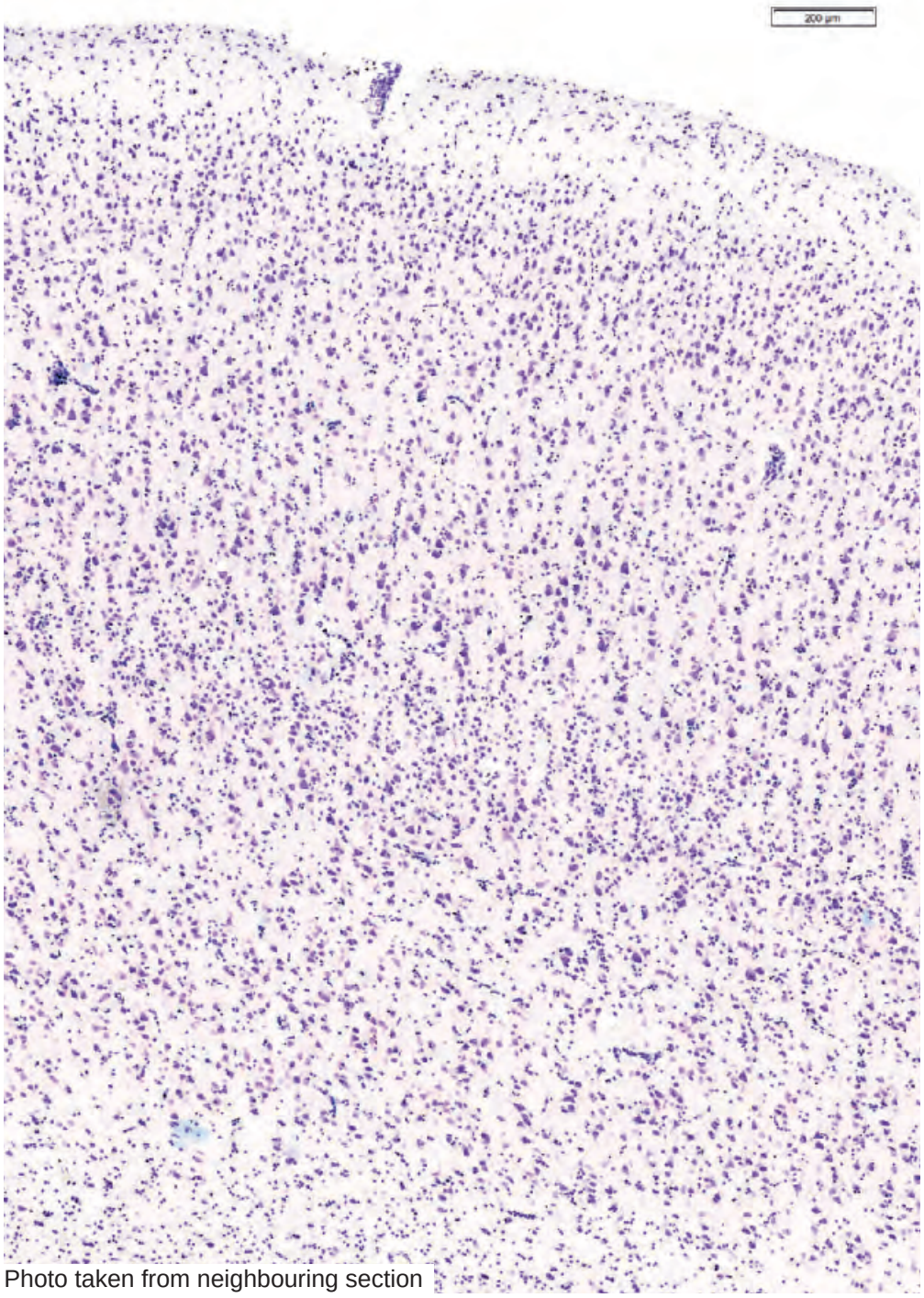
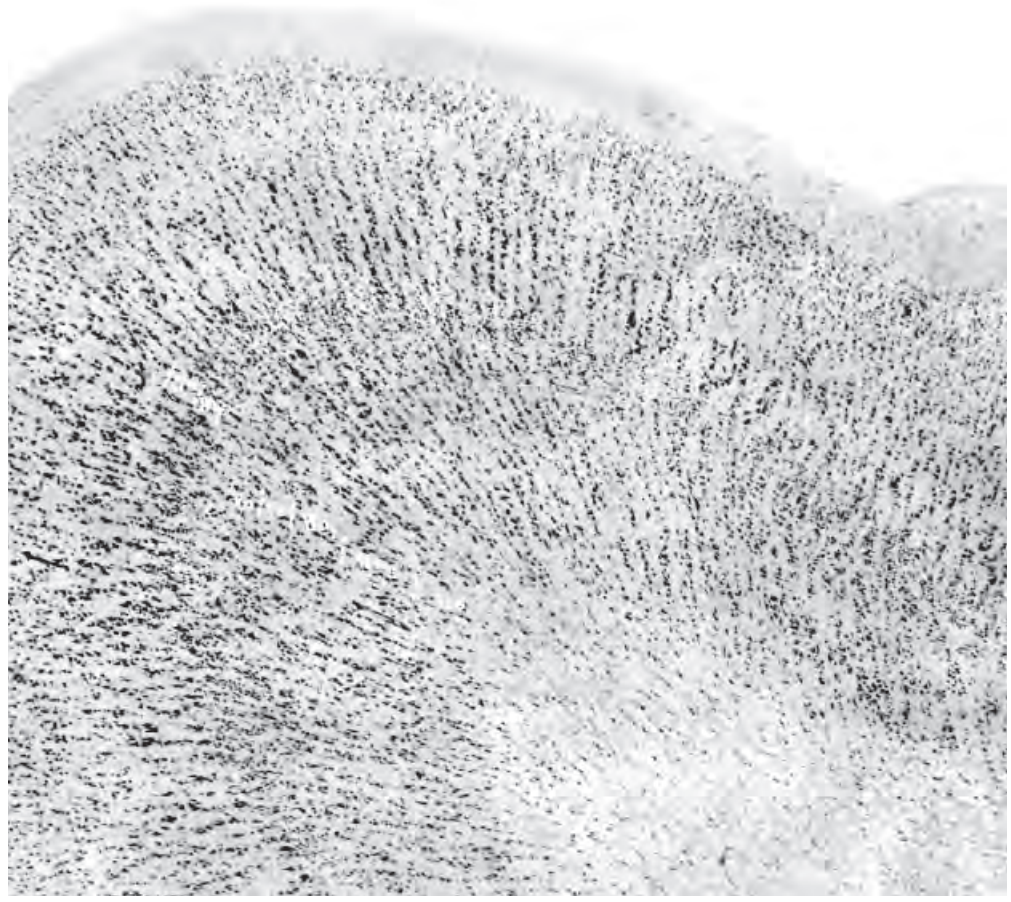
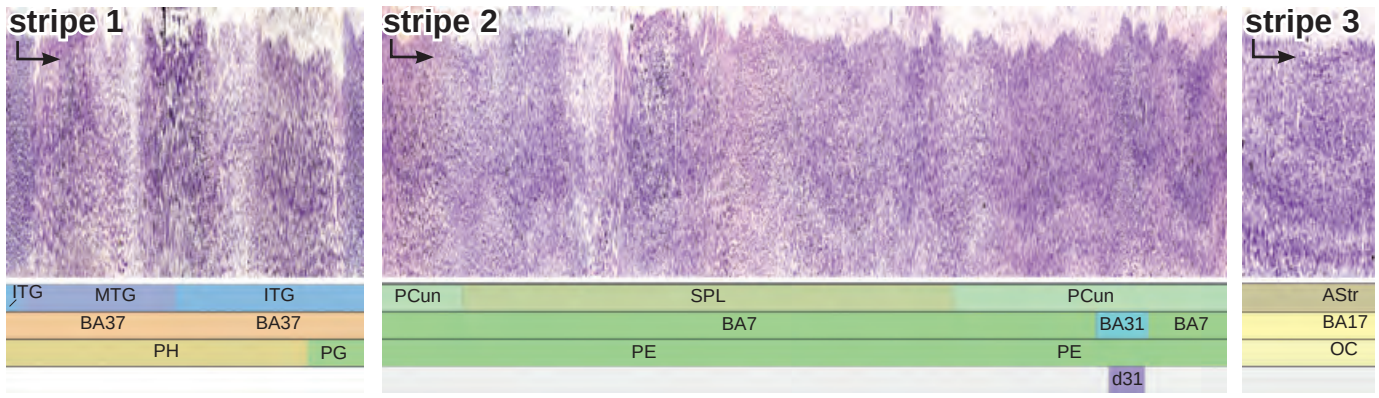
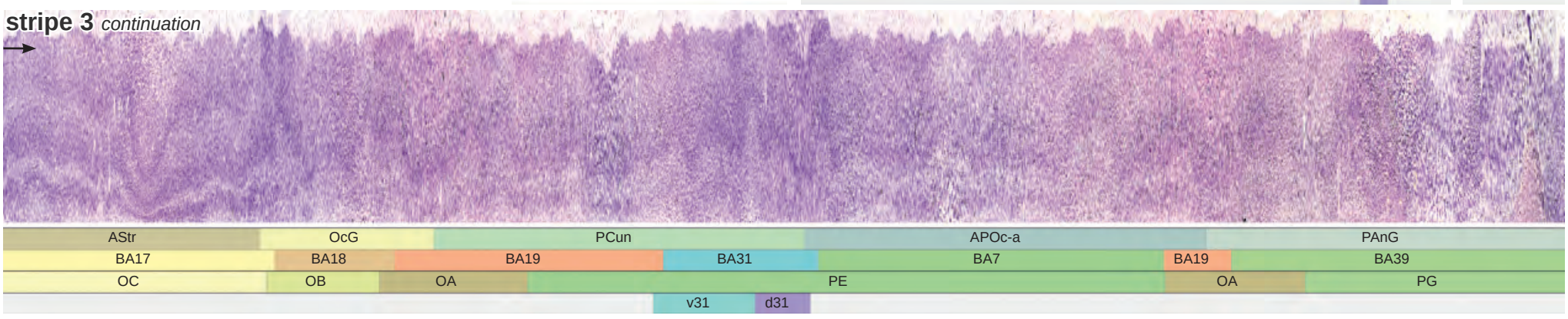


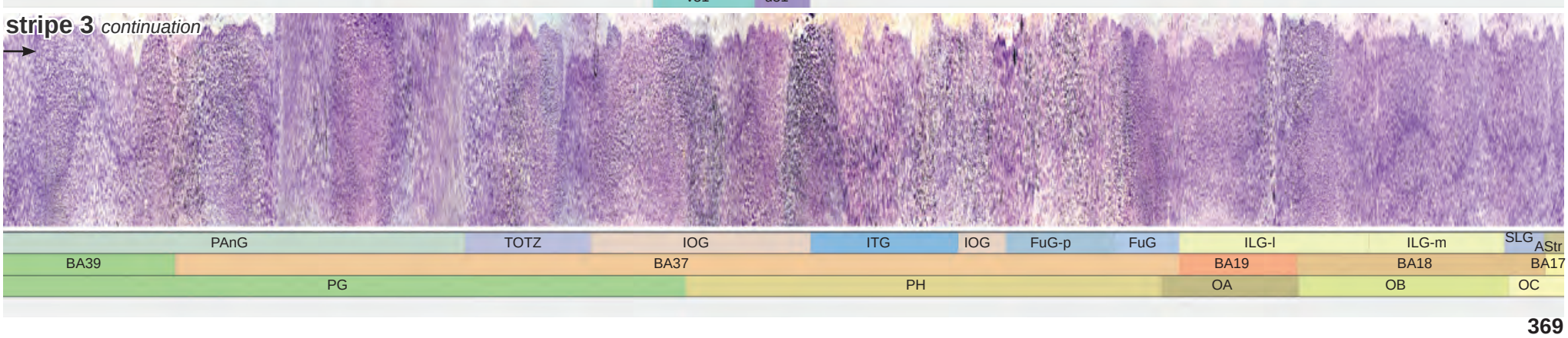
Photo taken from neighbouring section



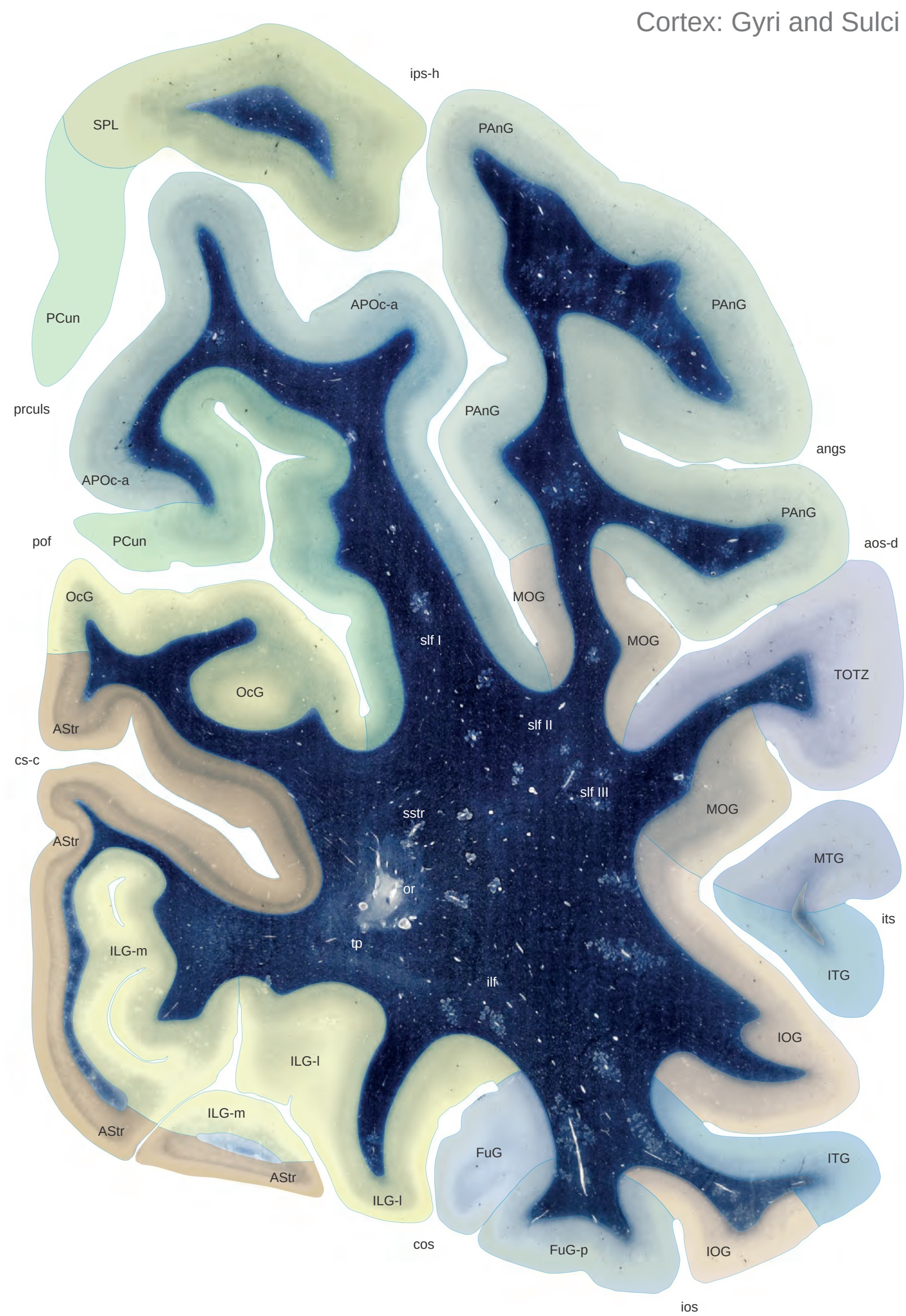
PE(gamma) Area parietalis superior gigantopyramidalis
von Economo and Koskinas (1925) Plate LXXI (71)

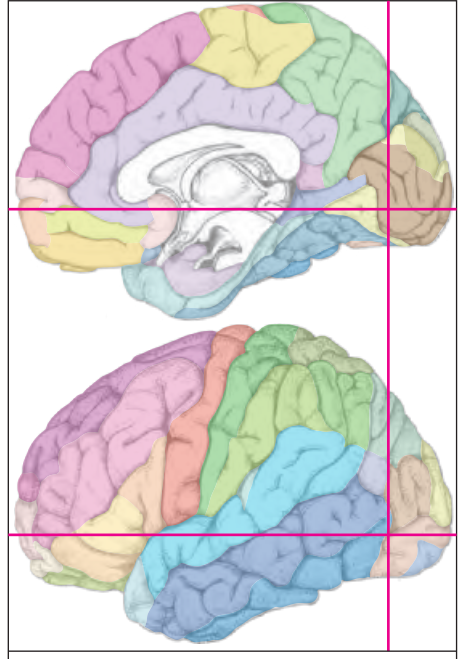






Cortex: Gyri and Sulci





MNI Position y = -82.26 mm
AHB Position y = 78.31 mm

Gyri

AStr striate area
APOc-a Arcus parieto-occipitalis, ant. division
FuG fusiform gyrus
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
ITG inferior temporal gyrus
IOG inferior occipital gyrus
MOG medial occipital gyrus
MTG middle temporal gyrus
OcG occipital gyrus
PAnG posterior angular gyrus
PCun precuneus
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Sulci

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central part
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus

Fibers

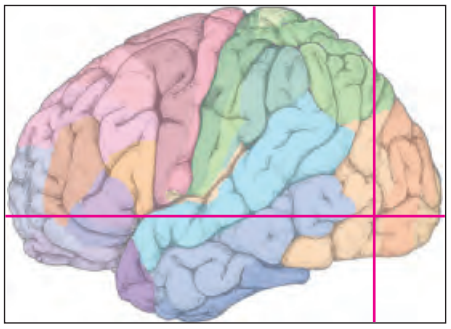
ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II superior longitudinal fascicle II, central comp.
slf III superior longitudinal fascicle III, vent. comp.
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 90
Slice Nr. 5412

Cortex: Brodmann Areas

90

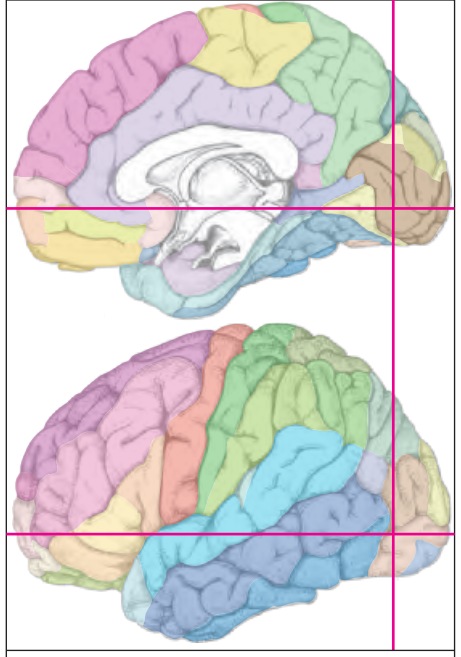
MNI: -82.26
ICL: 78.31
MCP: 63.57



BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central p.
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
its inferior temporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
sts superior temporal sulcus

Cortex: Gyri and Sulci



MNI Position y = -85.10 mm
AHB Position y = 80.99 mm

Gyri

AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
OcG occipital gyrus
MOG medial occipital gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division
SPL superior parietal lobule
TOTZ temporooccipital transition zone

Sulci

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central part
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal
lg-p lingual sulcus, posterior ramus
los lateral occipital sulcus
pof parieto-occipital fissure
ppa posterior marginal parietal sulcus (Vogt)
prculs precuneal limiting sulcus
rcs-i retrocalcarine sulcus, inferior part

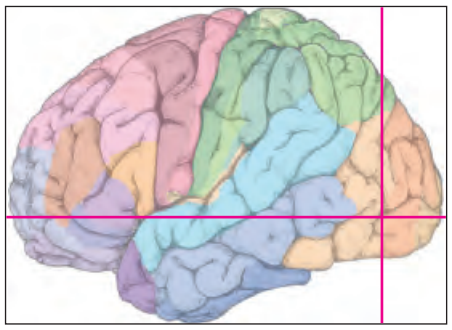
Fibers

ilf inferior longitudinal fascicle
or optic radiation
slf I superior longitudinal fascicle I, dorsal comp.
slf II/III superior longitudinal fascicle II/III
sstr sagittal stratum
tp tapetum

Fiber stain (Weigert)
Section Nr. 91
Slice Nr. 5512

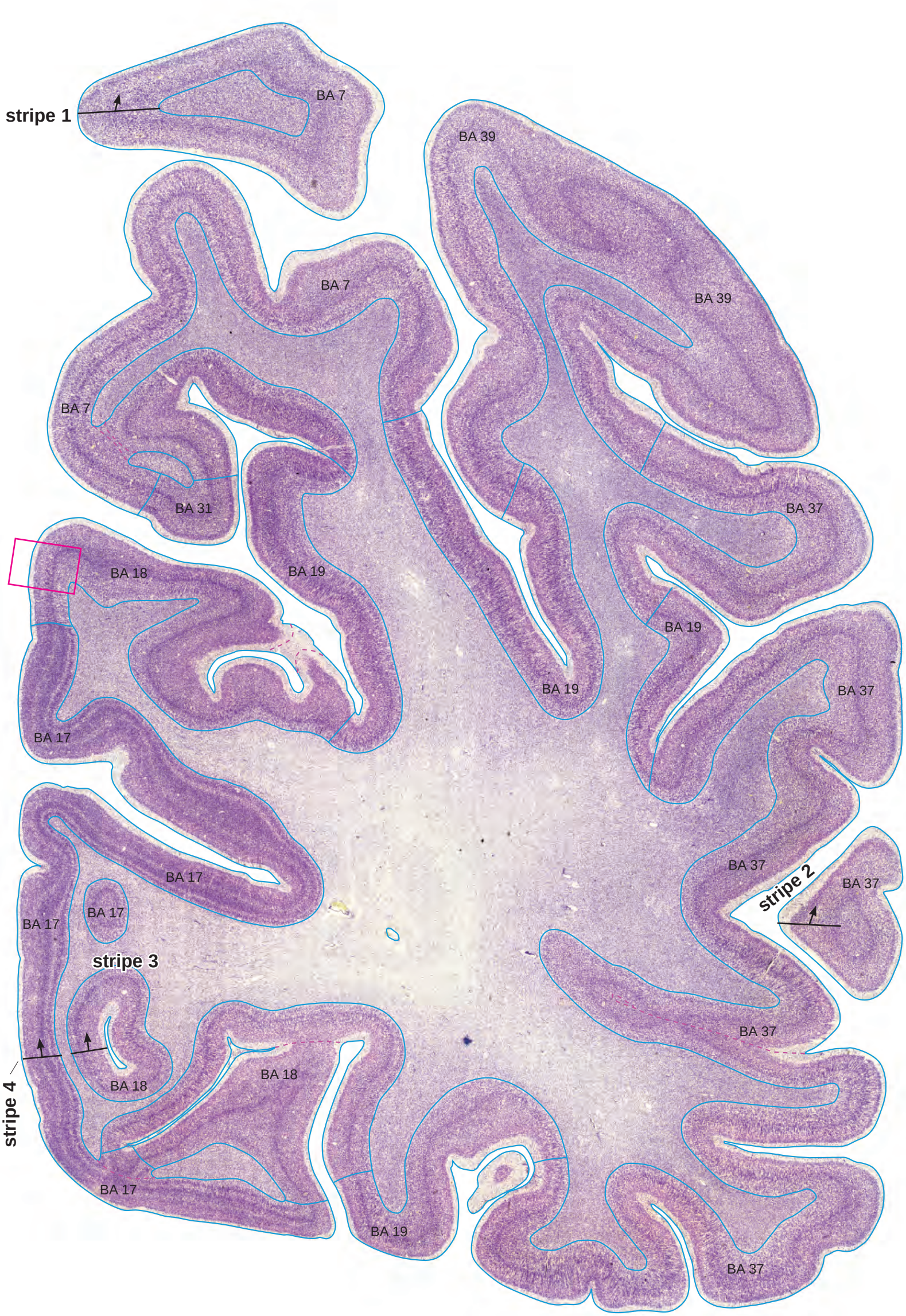
Cortex: Brodmann Areas

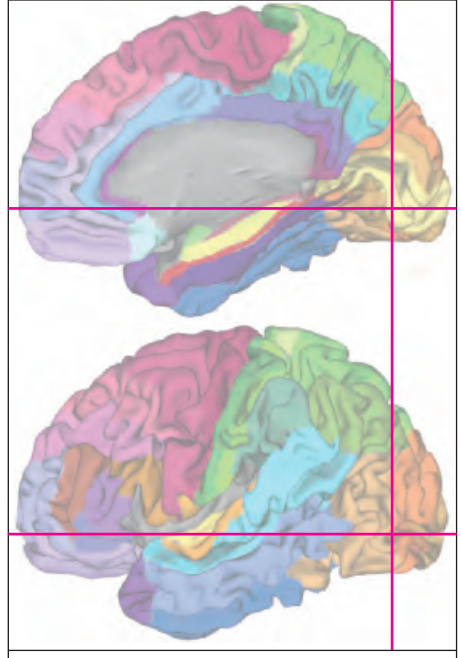
MNI: -85.10
ICL: 80.99
MCP: 66.25



BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central p.
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
lg-p lingual sulcus, posterior ramus
los lateral occipitotemporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
rcs-i retrocalcarine sulcus, lower branch





MNI Position y = -83.78 mm
AHB Position y = 79.76 mm

Gyral Pattern

AStr striate area
FuG fusiform gyrus
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
ITG inferior temporal gyrus
OcG occipital gyrus
MOG medial occipital gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division
TOTZ temporooccipital transition zone

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA31 area cingularis posterior dorsalis
BA37 area occipito-temporalis
BA39 area angularis

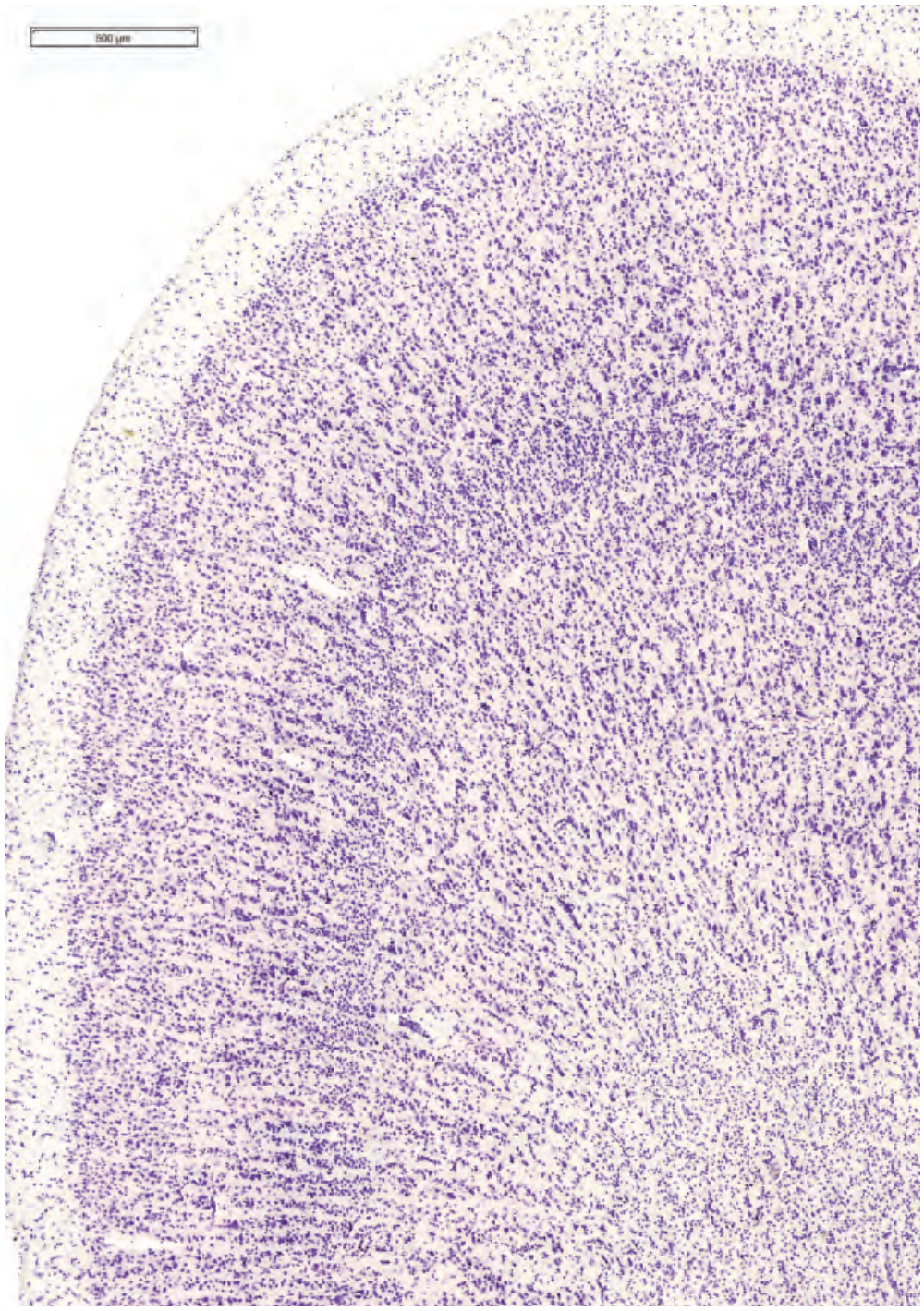
von Economo and Koskinas

OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area

Regions of Interest

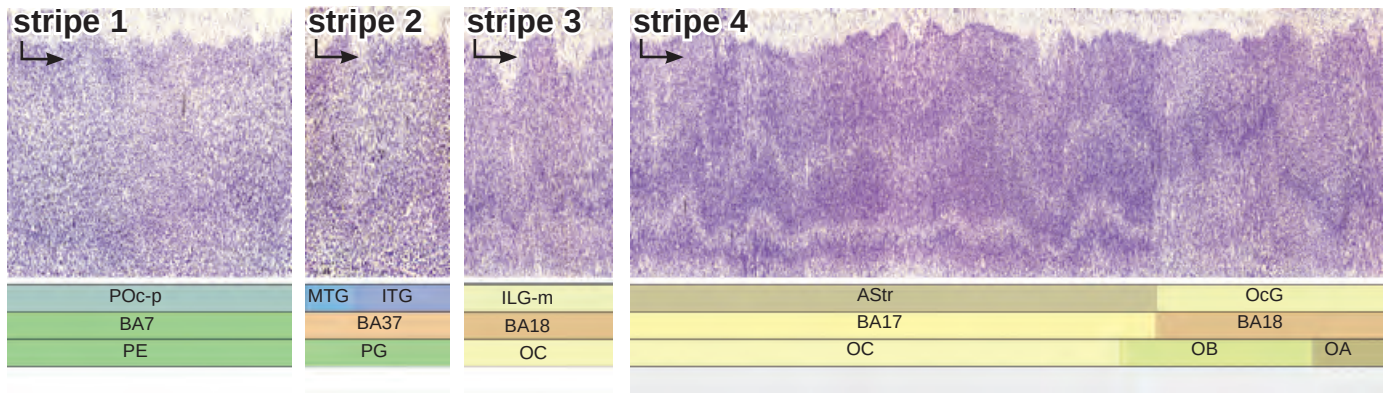
B. Vogt:
v31 ventral subregion of BA 31

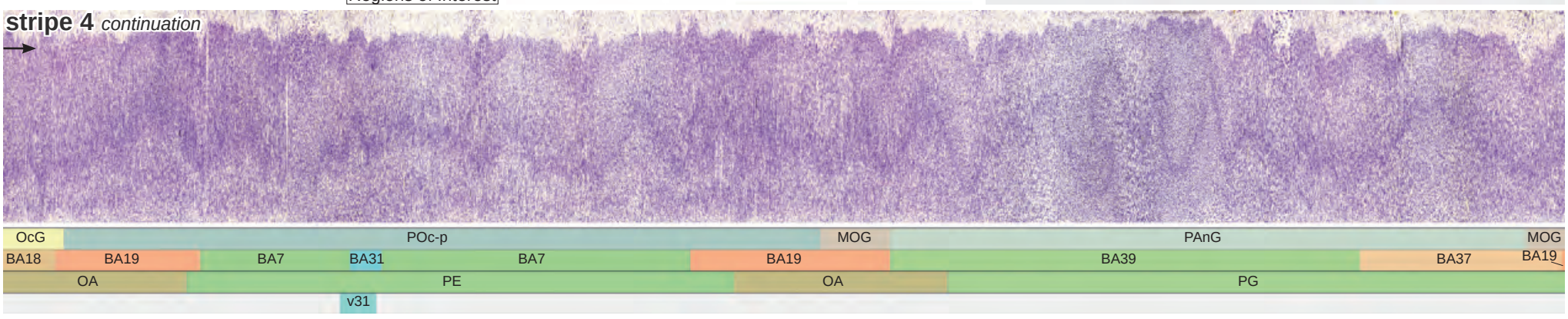
Cell stain (Nissl):
Section Nr. 91
Slice Nr. 5466

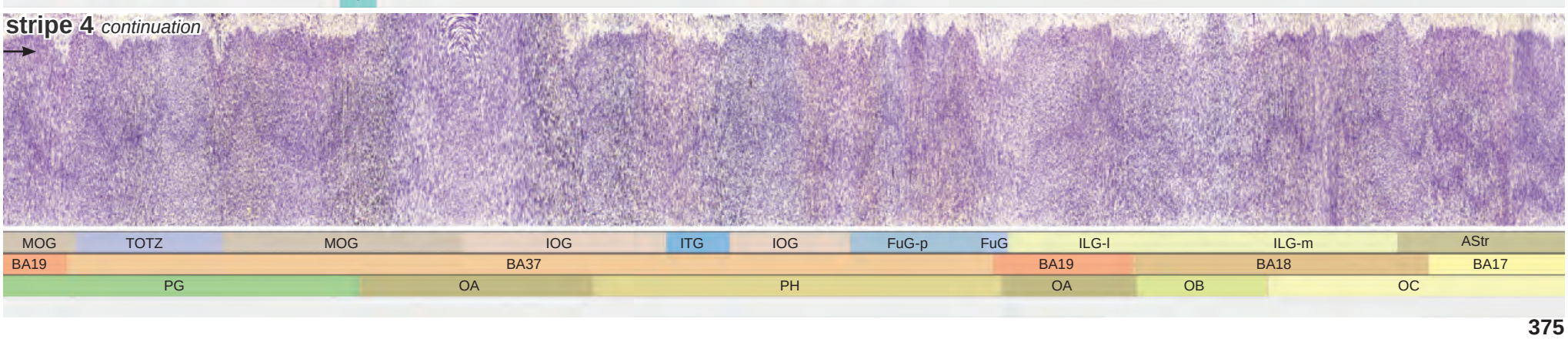


OA1 Area peristriata.

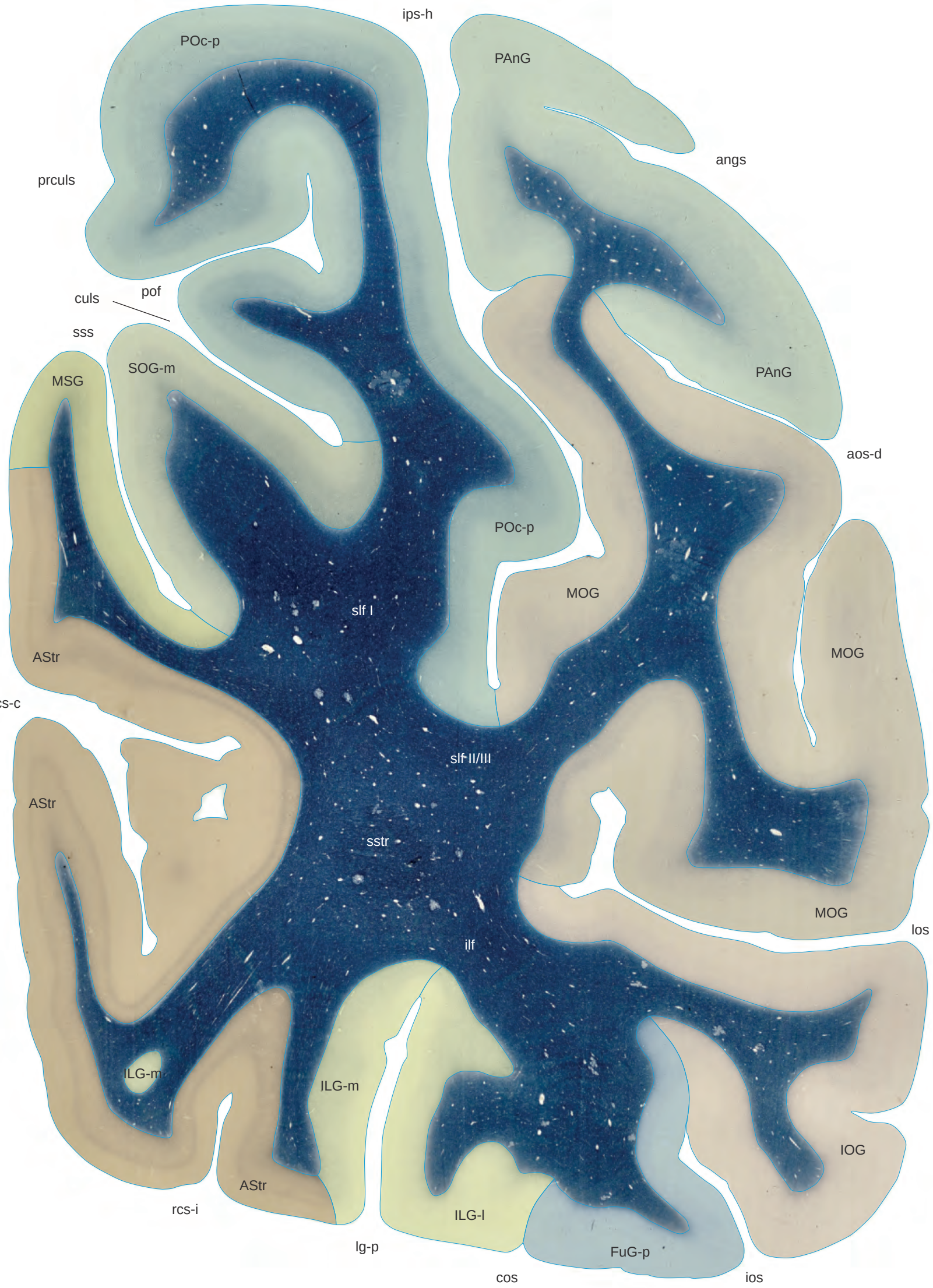
von Economo and Koskinas (1925) Plate LXXXII (82)

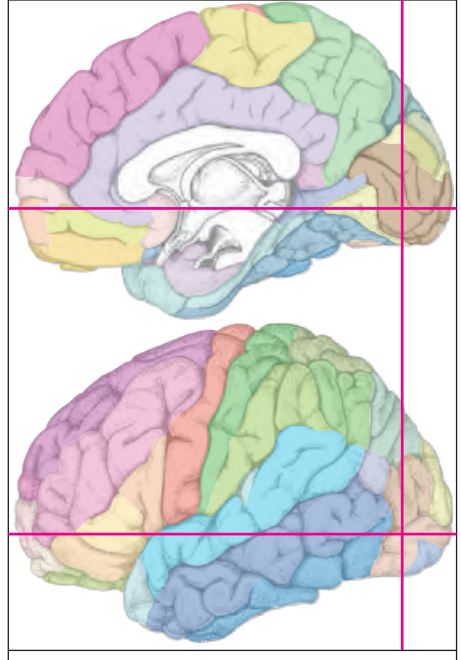






Cortex: Gyri and Sulci





MNI Position y = -87.89 mm
AHB Position y = 83.67 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
PAnG posterior angular gyrus
SOG-m superior occipital gyrus, medial part
MOG medial occipital gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division

Sulci

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central part
culs cuneal limiting sulcus
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
lg-p lingual sulcus, posterior ramus
los lateral occipital sulcus (lunate ?)
pof parieto-occipital fissure
prculs precuneal limiting sulcus
rcs-i retrocalcarine sulcus, inferior part
sss superior sagittal sulcus (vEconomo/Koskinas)

Fibers

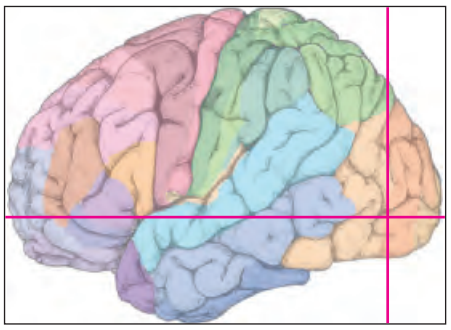
ilf inferior longitudinal fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II/III superior longitudinal fascicle II/III
sstr sagittal stratum

Fiber stain (Weigert)
Section Nr. 92
Slice Nr. 5612

Cortex: Brodmann Areas

92

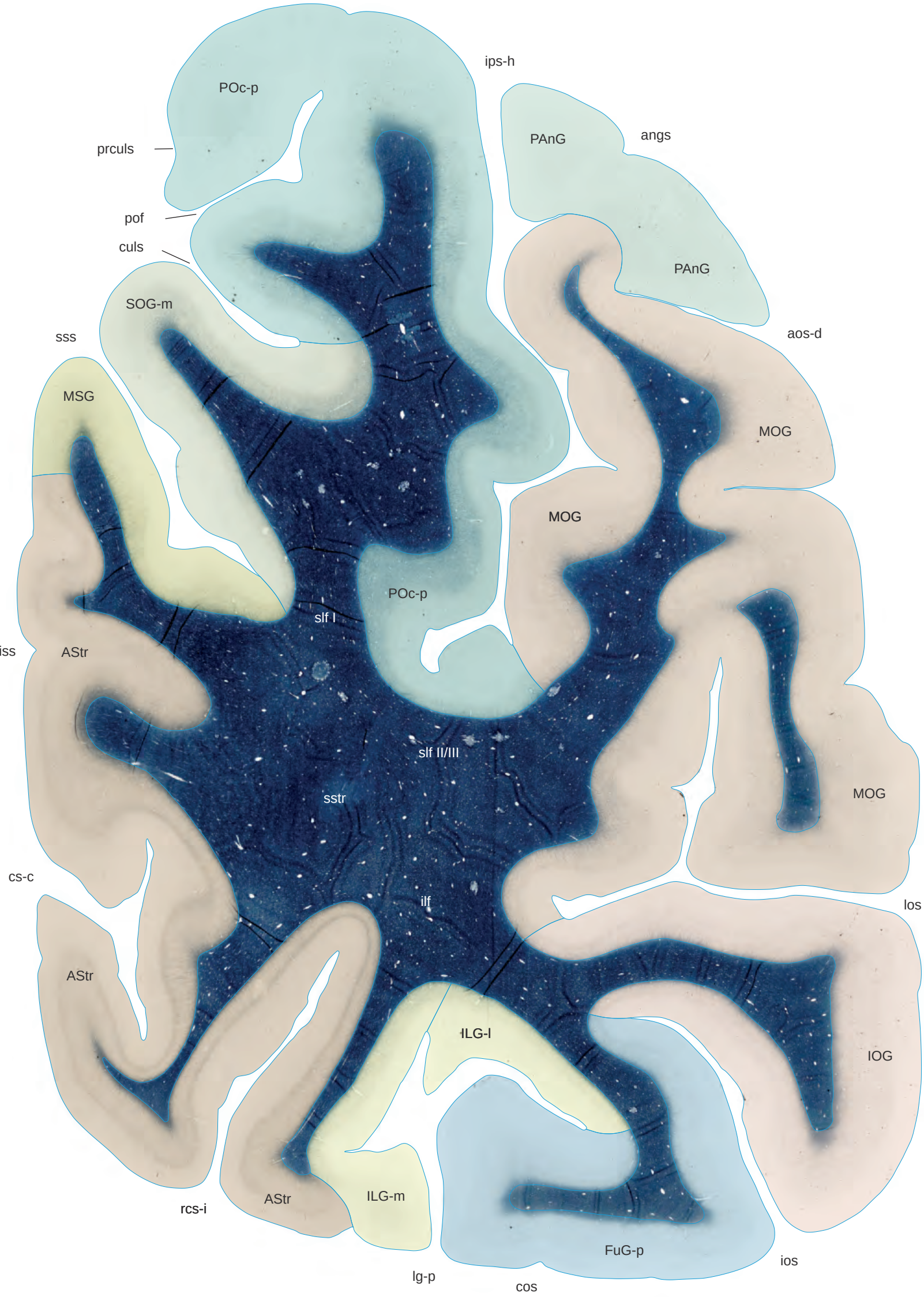
MNI: -87.89
ICL: 83.67
MCP: 68.93

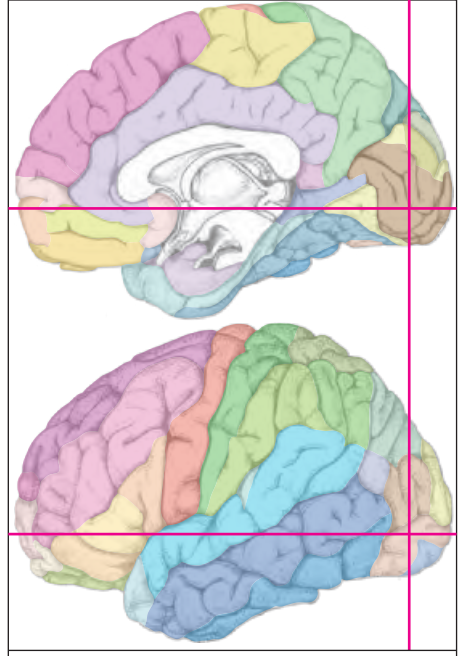


BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central p.
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
lg-p lingual sulcus, posterior ramus
los lateral occipitotemporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
rcs-i retrocalcarine sulcus, lower branch
sss superior sagittal sulcus

Cortex: Gyri and Sulci





MNI Position y = -90.73 mm
AHB Position y = 86.38 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
PAnG posterior angular gyrus
SOG-m superior occipital gyrus, medial part
MOG medial occipital gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division

Sulci

angs angular sulcus
aos-d anterior occipital sulcus, dorsal segment
culs cuneal limiting sulcus
cos collateral sulcus
cs-c calcarine sulcus, central part
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
iss inferior sagittal sulcus
lg-p lingual sulcus, posterior ramus
los lateral occipital sulcus
pof pariero-occipital sulcus (posterior ramus)
prculs percuneal limiting sulcus
rcs-i retrocalcarine sulcus, inferior part
sss superior sagittal sulcus

Fibers

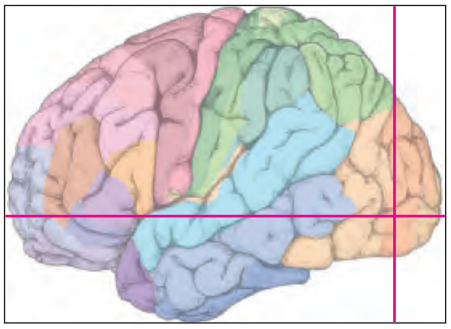
ilf inferior longitudinal fascicle
slf I superior longitudinal fascicle I, dorsal comp.
slf II/III superior longitudinal fascicle II/III
sstr sagittal stratum

Fiber stain (Weigert)
Section Nr. 93
Slice Nr. 5713

Cortex: Brodmann Areas

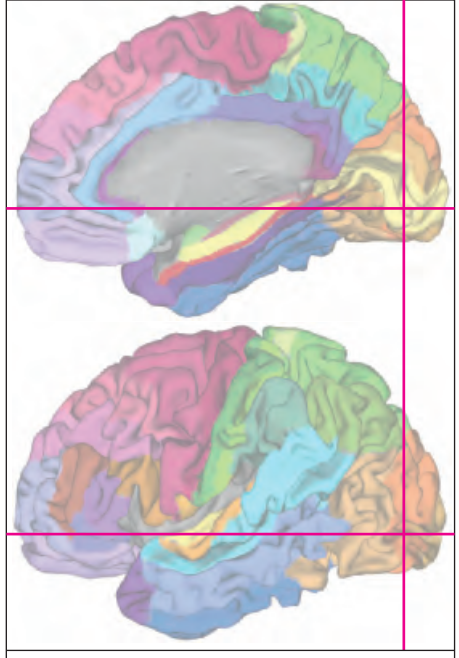
93

MNI: -90.73
ICL: 86.38
MCP: 71.64



BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
aos-d anterior occipital sulcis, dorsal segment
cos collateral sulcus
cs-c calcarine sulcus, central p.
ios inferior occipital sulcus
ips-h intraparietal sulcus, horizontal segment
iss inferior sagittal sulcus (S. limitans superior)
lg-p lingual sulcus, posterior ramus
los lateral occipitotemporal sulcus
pof parieto-occipital fissure
prculs precuneal limiting sulcus
rcs-i retrocalcarine sulcus, lower branch
sss superior sagittal sulcus



MNI Position y = -89.35 mm
AHB Position y = 85.07 mm

Gyral Pattern

AStr striate area
FuG-p fusiform gyrus, post. part
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
PAnG posterior angular gyrus
SOG-m superior occipital gyrus, medial part
MOG medial occipital gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division

Brodmann Areas

BA7 area parietalis superior
BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis
BA37 area occipito-temporalis
BA39 area angularis

von Economo and Koskinas

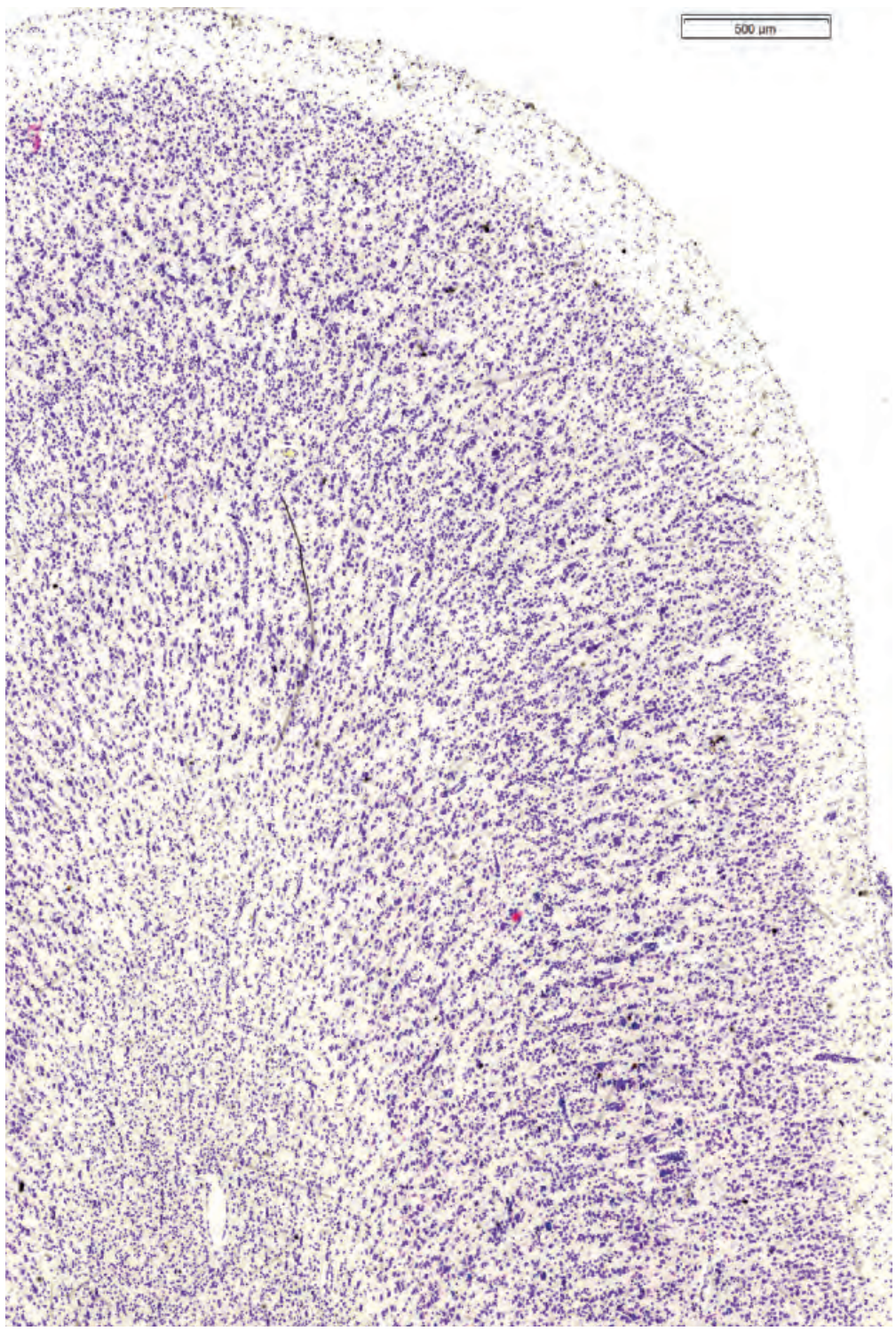
OA peristriate area
OB parastriate area
OC striate area (granulosa)
PE superior parietal area
PG angular area
PH basal (temporooccipital) parietal area

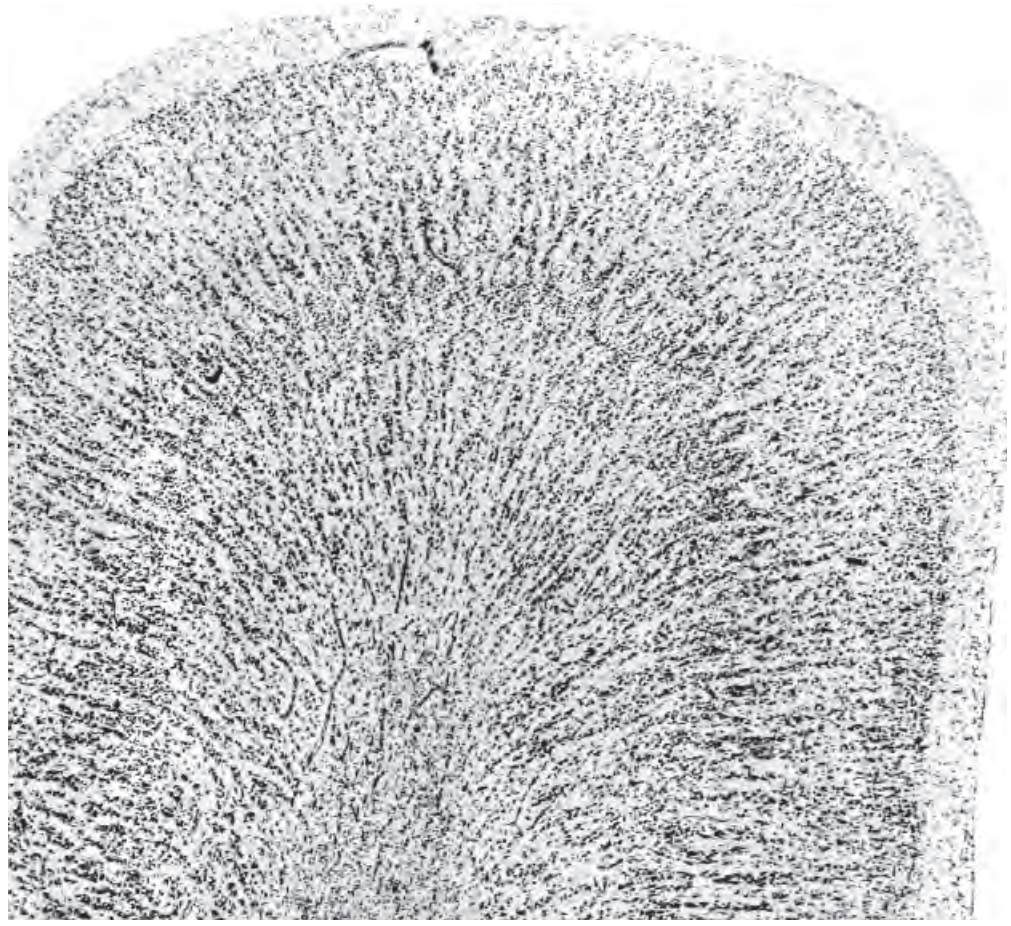
Regions of Interest

-

stripe 1

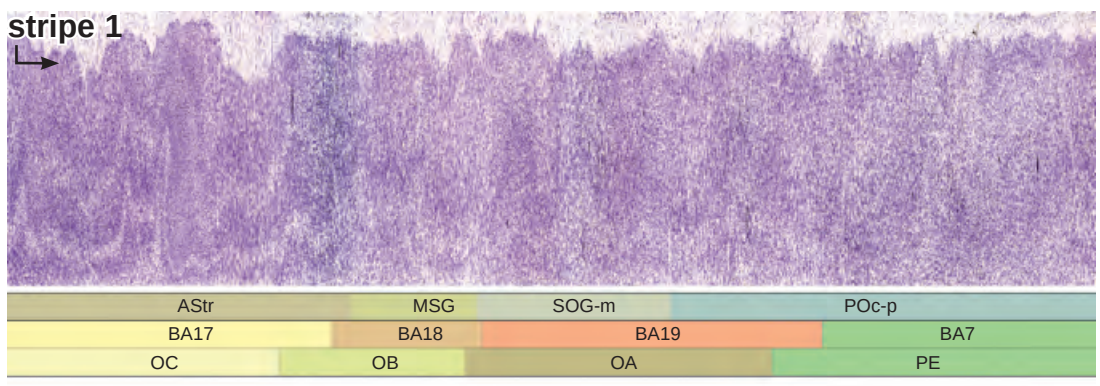
Cell stain (Nissl):
Section Nr. 93
Slice Nr. 5664

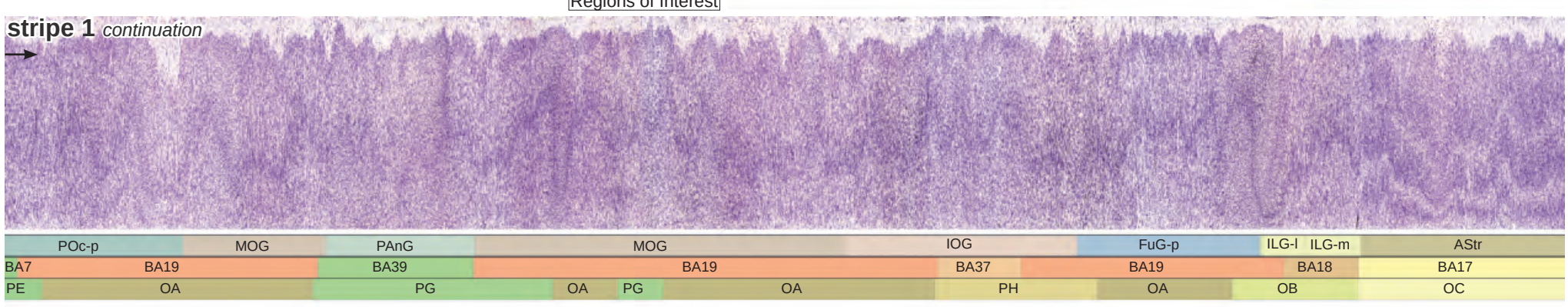




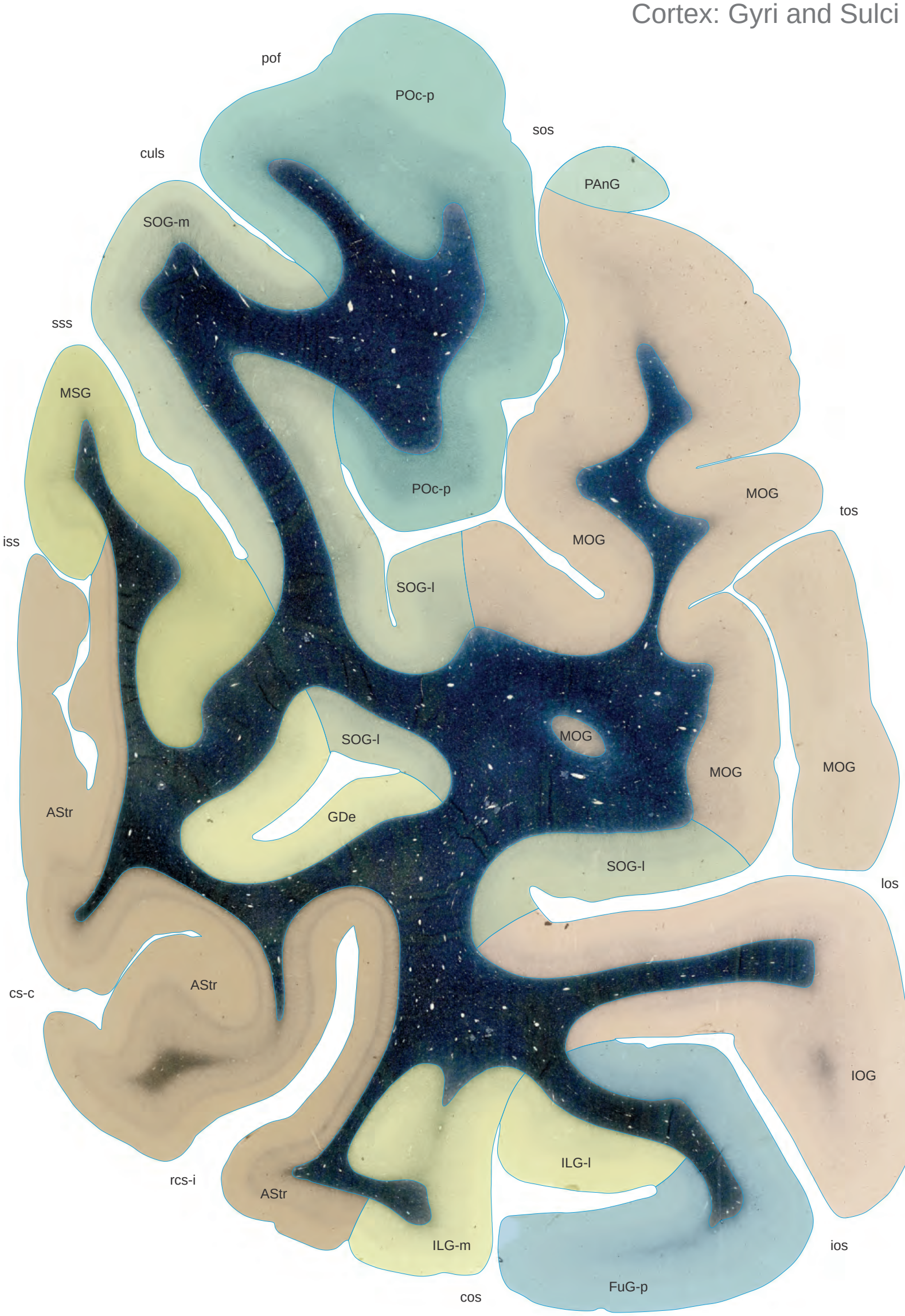
OA2(m) Area peristriata anterior magnocellularis.

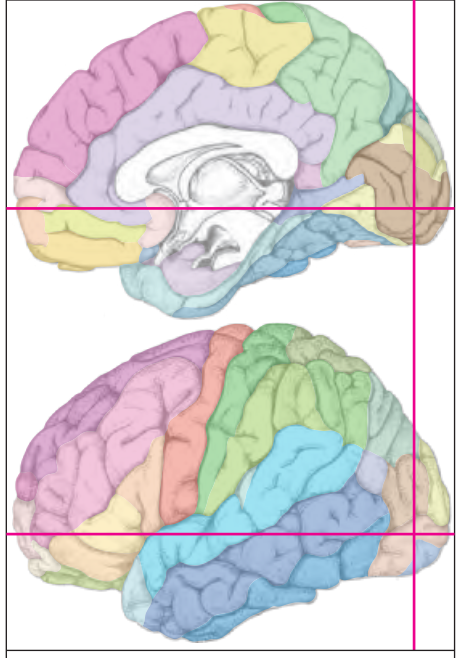
von Economo and Koskinas (1925) Plate LXXXI (81)





Cortex: Gyri and Sulci





MNI Position y = -93.55 mm
AHB Position y = 89.03 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
ILG-l inferior lingual gyrus, lateral part
ILG-m inferior lingual gyrus, medial part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
PAnG posterior angular gyrus
POc-p Arcus parieto-occipitalis, post. division
SOG-l superior occipital gyrus, lateral part
SOG-m superior occipital gyrus, medial part

Sulci

culs cuneal limiting sulcus
cos collateral sulcus
cs-c calcarine sulcus, central part
ios inferior occipital sulcus
iss inferior sagittal sulcus
los lateral occipital sulcus
pof parietooccipital sulcus
rcs-i retrocalcarine sulcus, inferior part
sos superior occipital sulcus
sss superior sagittval sulcus
tos transverse occipital sulcus

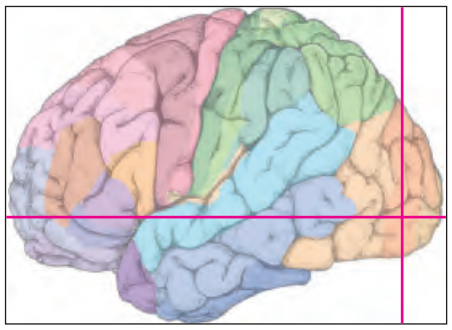
Fibers

-

Fiber stain (Weigert)
Section Nr. 94
Slice Nr. 5812

Cortex: Brodmann Areas

MNI: -93.55
ICL: 89.03
MCP: 74.29

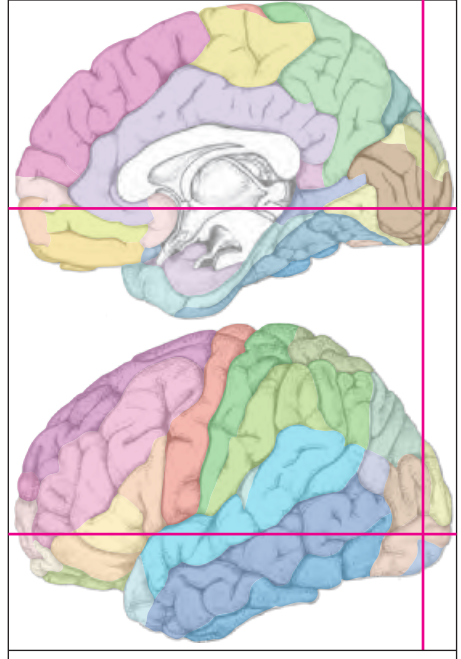


BA1-52 Brodmann areas 1-52 (see p. 101)

angs angular sulcus
cos collateral sulcus
cs-c calcarine sulcus, central p.
culs cuneal limiting sulcus
ios inferior occipital sulcus
iss inferior sagittal sulcus (S. limitans superior)
los lateral occipitotemporal sulcus
pof parieto-occipital fissure
rcs-i retrocalcarine sulcus, lower branch
sos superior occipital sulcus
sss superior sagittal sulcus
tos transverse occipital sulcus

Cortex: Gyri and Sulci

culs
tos-m
POc-p
tos
SOG-m
sss
MOG
MSG
tos-m
SOG-l
tos-l
tos
SOG-l
GDe
MOG
AStr
los
iss
SOG-l
IOG
AStr
rcs-s
IOG
AStr
AStr
ios
FuG-p
ILG-l
cos



MNI Position y = -96.33 mm
AHB Position y = 91.71 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
ILG-l inferior lingual gyrus, lateral part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
POc-p Arcus parieto-occipitalis, post. division
SOG-l superior occipital gyrus, lateral part
SOG-m superior occipital gyrus, medial part

Sulci

cos collateral sulcus
culs cuneal limiting sulcus
ios inferior occipital sulcus
iss inferior sagittal sulcus
los lateral occipital sulcus (lunate ?)
rcs-s retrocalcarine sulcus, superior part
sss superior sagittal sulcus
tos transverse occipital sulcus
tos-l transverse occipital sulcus, lateral part
tos-m transverse occipital sulcus, medial part

Fibers

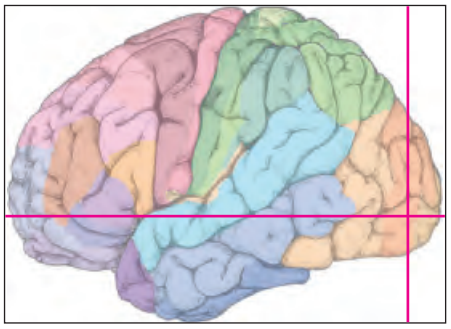
-

Fiber stain (Weigert)
Section Nr. 95
Slice Nr. 5912

Cortex: Brodmann Areas

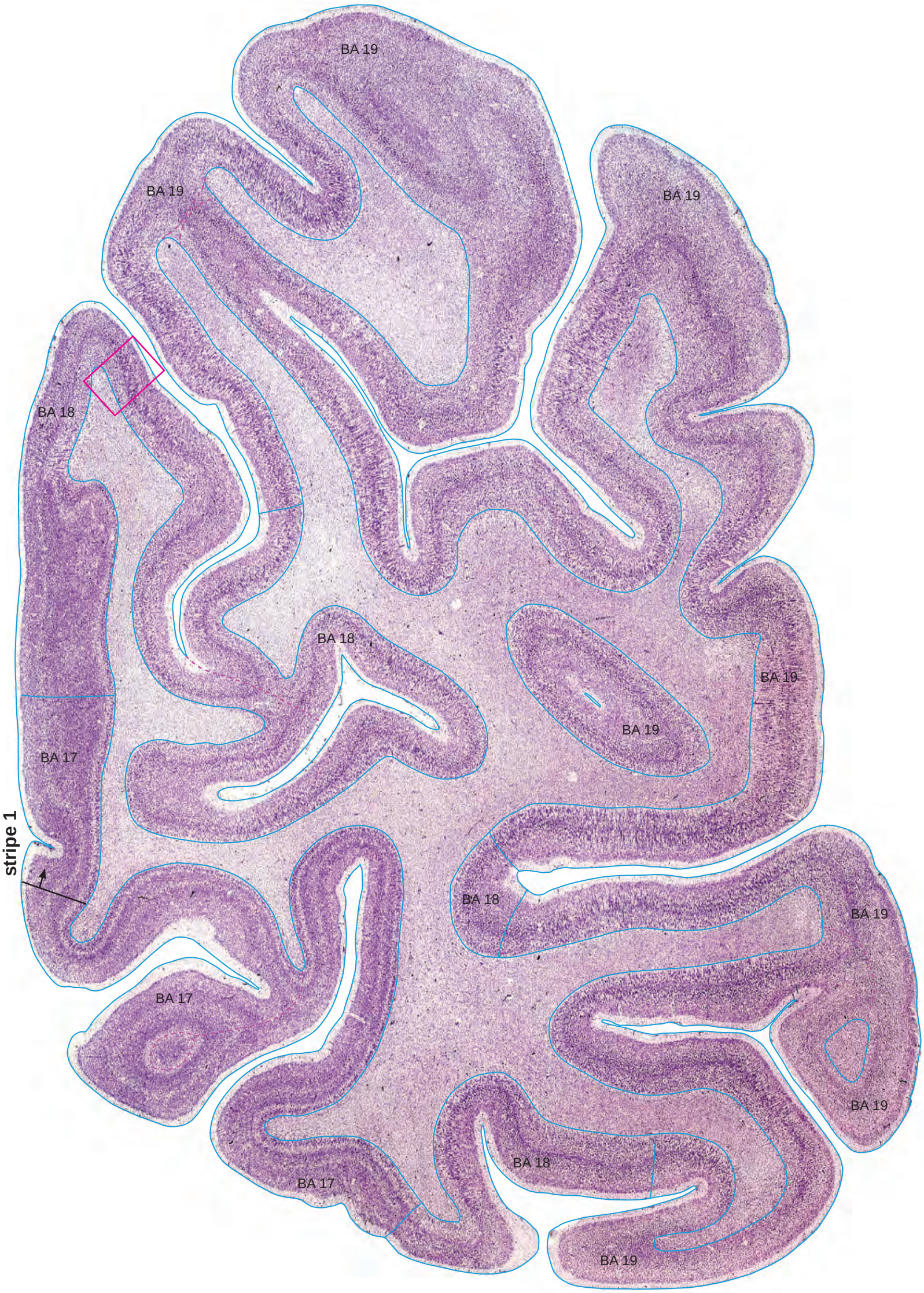
95

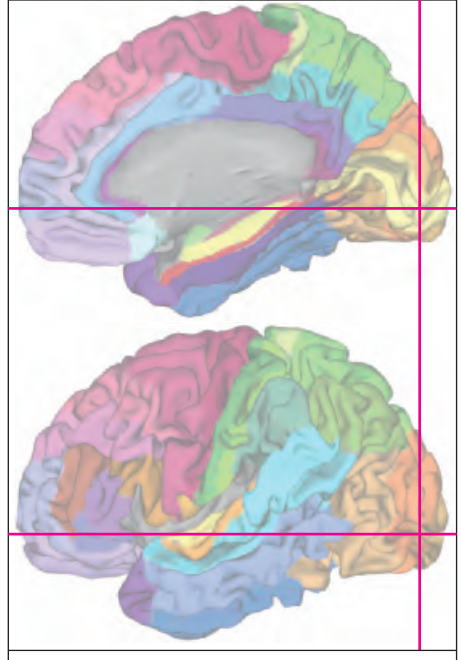
MNI: -96.33
ICL: 91.71
MCP: 76.97



BA1-52 Brodmann areas 1-52 (see p. 101)

cos collateral sulcus
culs cuneal limiting sulcus
ios inferior occipital sulcus
iss inferior sagittal sulcus (S. limitans superior)
los lateral occipitotemporal sulcus
pof parieto-occipital fissure
rcs-s retrocalcarine sulcus, upper branch
sss superior sagittal sulcus
tos transverse occipital sulcus





MNI Position y = -94.98 mm
AHB Position y = 90.43 mm

Gyral Pattern

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
ILG-l inferior lingual gyrus, lateral part
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
POc-p Arcus parieto-occipitalis, post. division
SOG-l superior occipital gyrus, lateral part
SOG-m superior occipital gyrus, medial part

Brodmann Areas

BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis

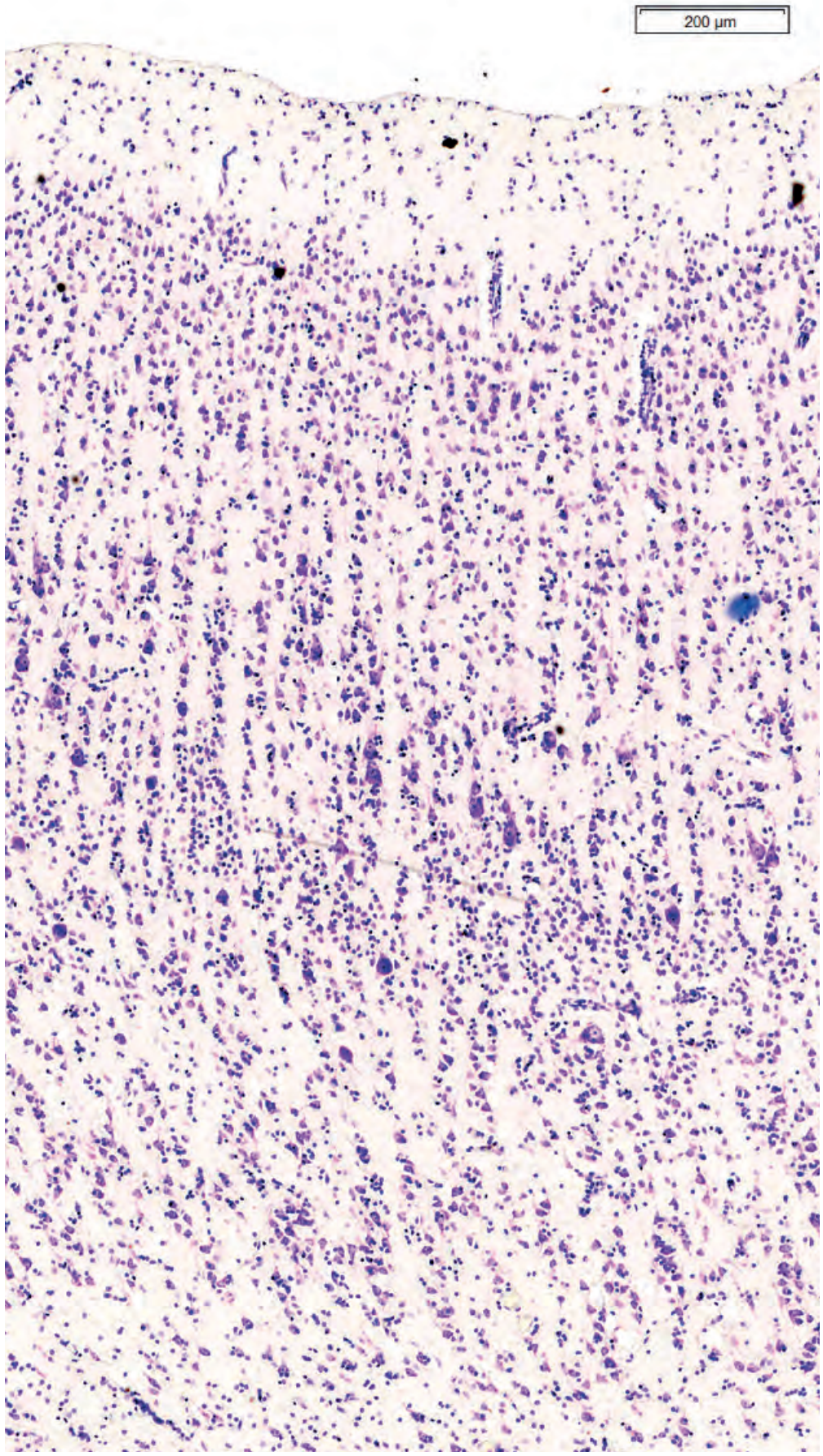
von Economo and Koskinas

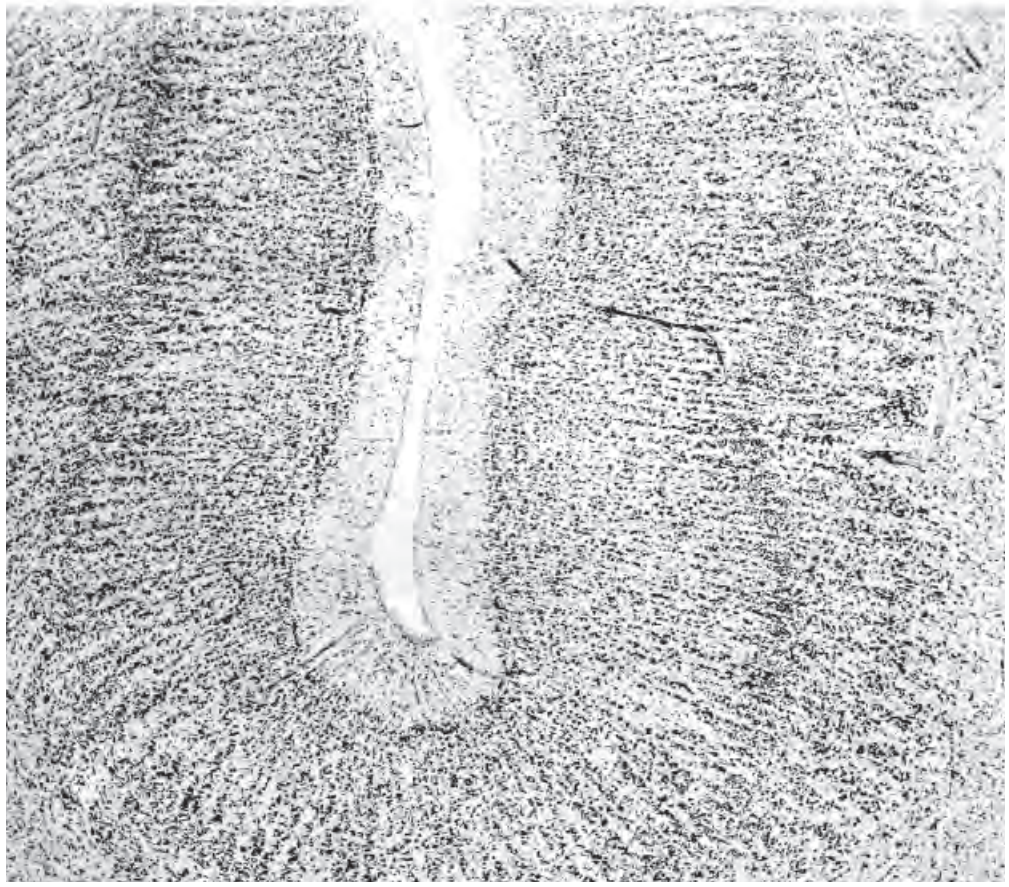
OA peristriate area
OB parastriate area
OC striate area (granulosa)

Regions of Interest

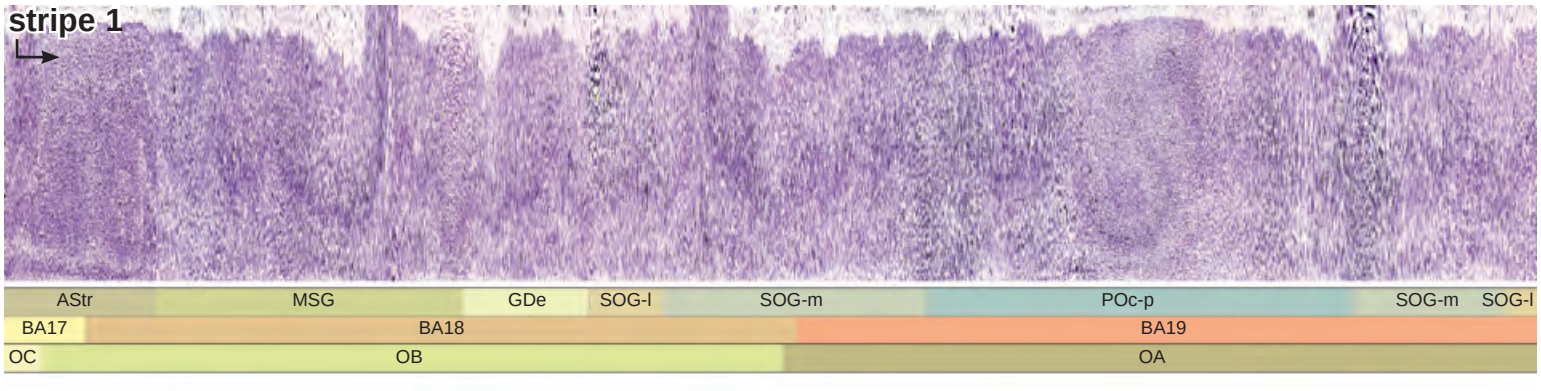
-

Cell stain (Nissl):
Section Nr. 95
Slice Nr. 5864

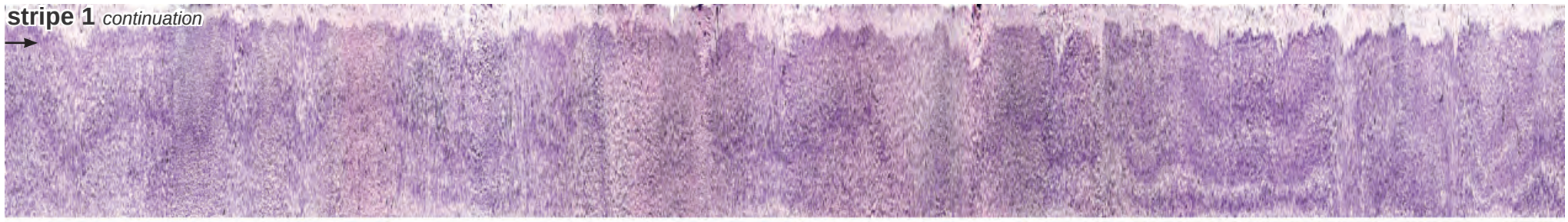




OB Area parastriata. OB omega Macula granulosa areae parastriatae.
von Economo and Koskinas (1925) Plate LXXXIV (84)



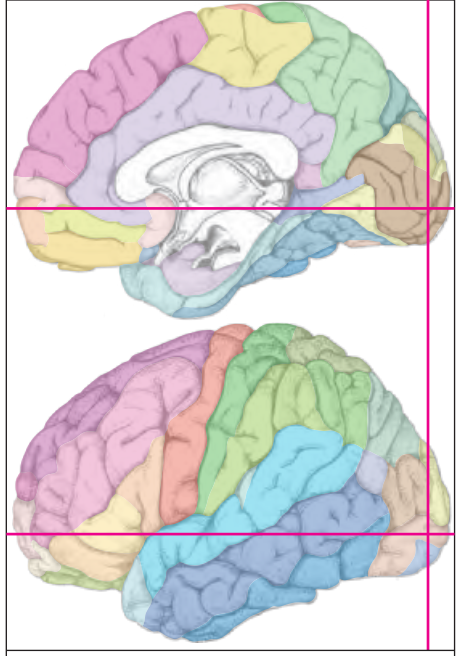
Gyral pattern	AStr	MSG	GDe	SOG-l	SOG-m	POc-p	SOG-m	SOG-l
Brodmann areas	BA17	BA18				BA19		
von Economo	OC	OB				OA		
Regions of Interest								



SOG-l	MOG	SOG-l	IOG	FuG-p	ILG-l	AStr
BA19		BA18	BA19		BA18	BA17
OA		OB	OA		OB	OC

Cortex: Gyri and Sulci

culs
tos-m
POc-p
SOG-m
sss
tos-m
SOG-l
tos-l
MOG
GDe
SOG-l
tos-l
MSG
SOG-l
GDe
los
iss
rcs-s
AStr
IOG
AStr
FuG-p
AStr
ops



MNI Position y = -99.18 mm
AHB Position y = 94.42 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
IOG inferior occipital gyrus
MOG medial occipital gyrus
MSG middle sagittal gyrus
POc-p Arcus parieto-occipitalis, post. division
SOG-l superior occipital gyrus, lat. part
SOG-m superior occipital gyrus, medial part

Sulci

culs cuneal limiting sulcus
iss inferior sagittal sulcus
los lateral occipital sulcus
ops occipitopolar sulcus
rcs-s retrocalcarine sulcus, superior part
sss superior sagittal sulcus
tos-l transverse occipital sulcus, lateral part
tos-m transverse occipital sulcus, medial part

Fibers

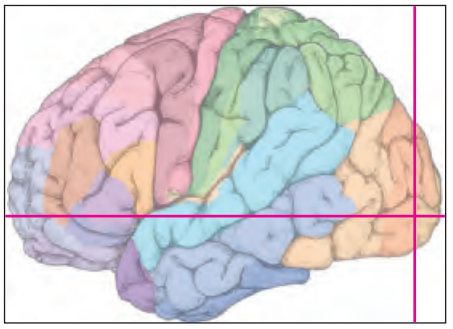
-

Fiber stain (Weigert)
Section Nr. 96
Slice Nr. 6013

Cortex: Brodmann Areas

96

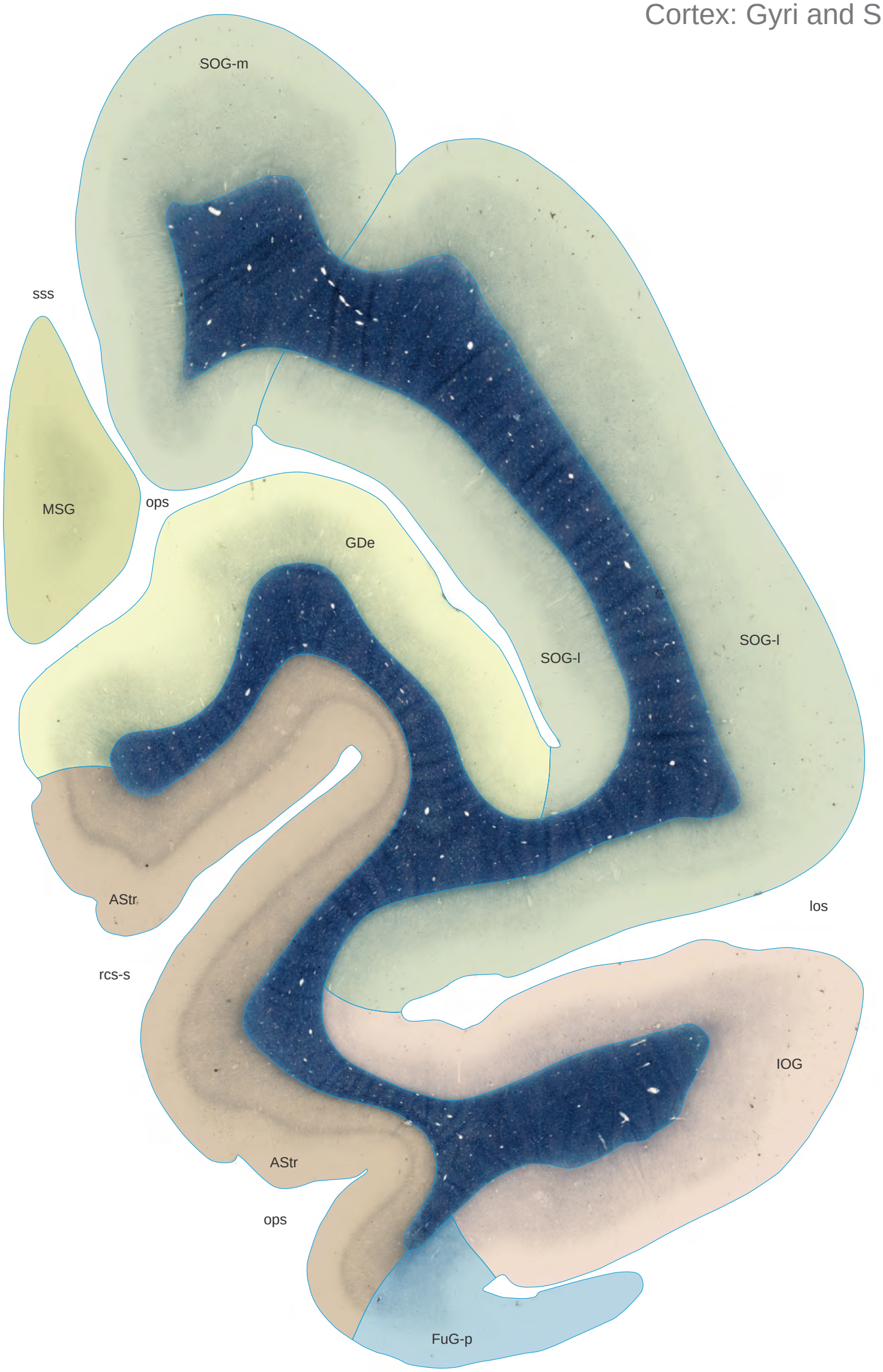
MNI: -99.18
ICL: 94.42
MCP: 79.68

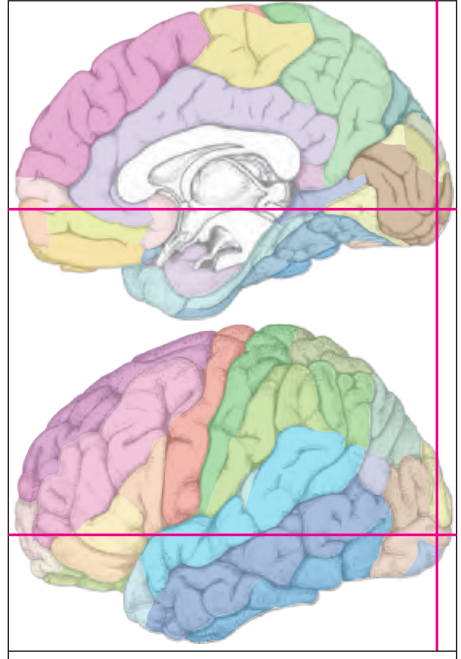


BA1-52 Brodmann areas 1-52 (see p. 101)

culs cuneal limiting sulcus
iss inferior sagittal sulcus (S. limitans superior)
los lateral occipitotemporal sulcus
ops occipitopolar sulcus (extreme fissure of Seitz)
rcs-s retrocalcarine sulcus, upper branch
sss superior sagittal sulcus
tos-l transverse occipital sulcus, lateral ramus
tos-m transverse occipital sulcus, medial ramus

Cortex: Gyri and Sulci





MNI Position y = -101.99 mm
AHB Position y = 97.10 mm

Gyri

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
IOG inferior occipital gyrus
MSG middle sagittal gyrus
SOG-l superior occipital gyrus, lat. part
SOG-m superior occipital gyrus, medial part

Sulci

los lateral occipital sulcus
ops occipitopolar sulcus
rcs-s retrocalcarine sulcus, superior part
sss superior sagittal sulcus

Fibers

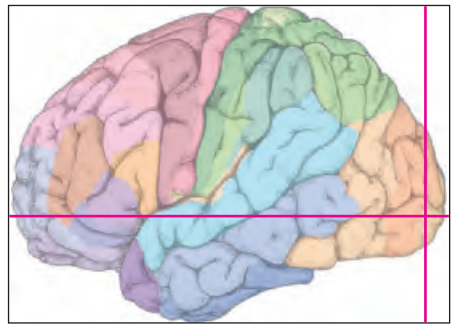
-

Fiber stain (Weigert)
Section Nr. 97
Slice Nr. 6113

Cortex: Brodmann Areas

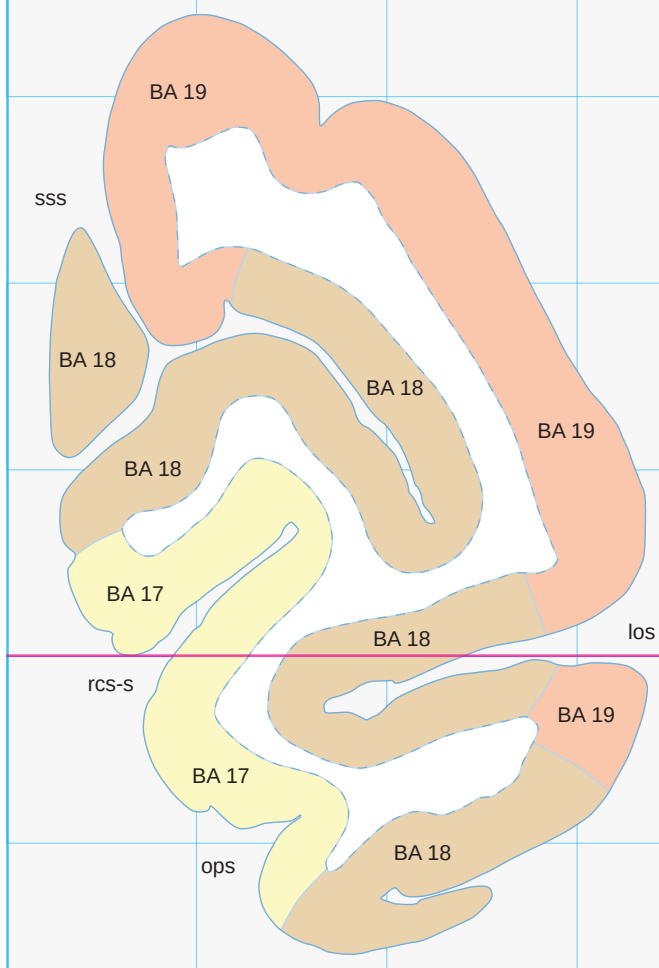
97

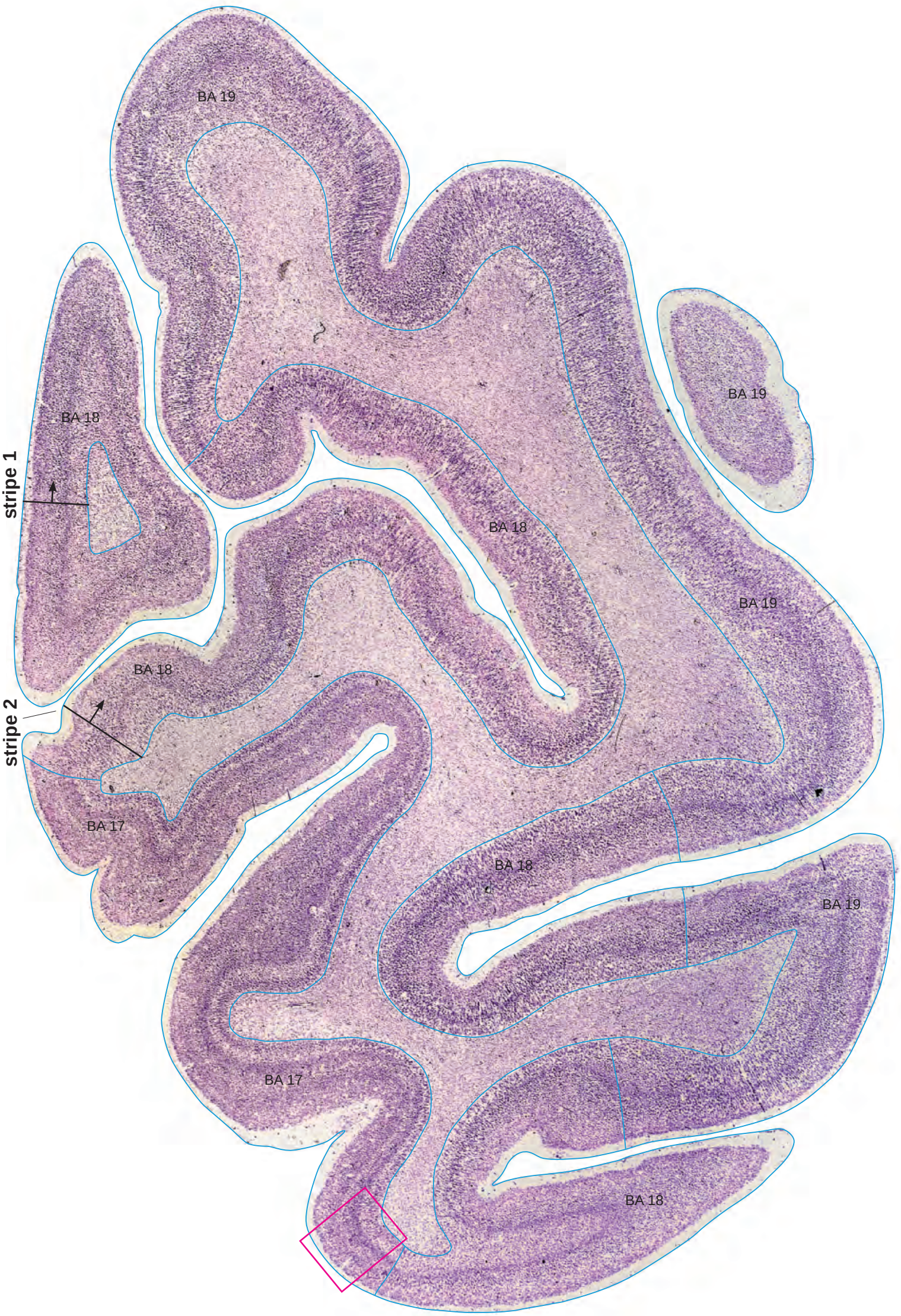
MNI: -101.99
ICL: 97.10
MCP: 82.36

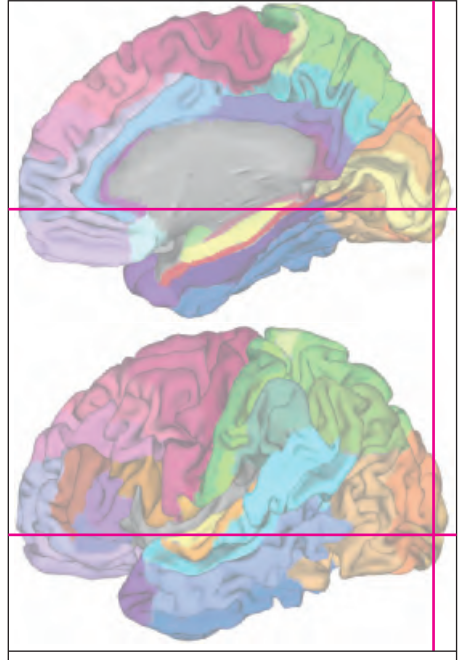


BA1-52 Brodmann areas 1-52 (see p. 101)

los lateral occipitotemporal sulcus
ops occipitopolar sulcus (extreme fissure of Seitz)
rcs-s retrocalcarine sulcus, upper branch
sss superior sagittal sulcus







MNI Position y = -100.61 mm
AHB Position y = 95.79 mm

Gyral Pattern

AStr striate area
FuG-p fusiform gyrus, post. part
GDe gyrus descendens
IOG inferior occipital gyrus
MSG middle sagittal gyrus
SOG-l superior occipital gyrus, lat. part
SOG-m superior occipital gyrus, medial part

Brodmann Areas

BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis

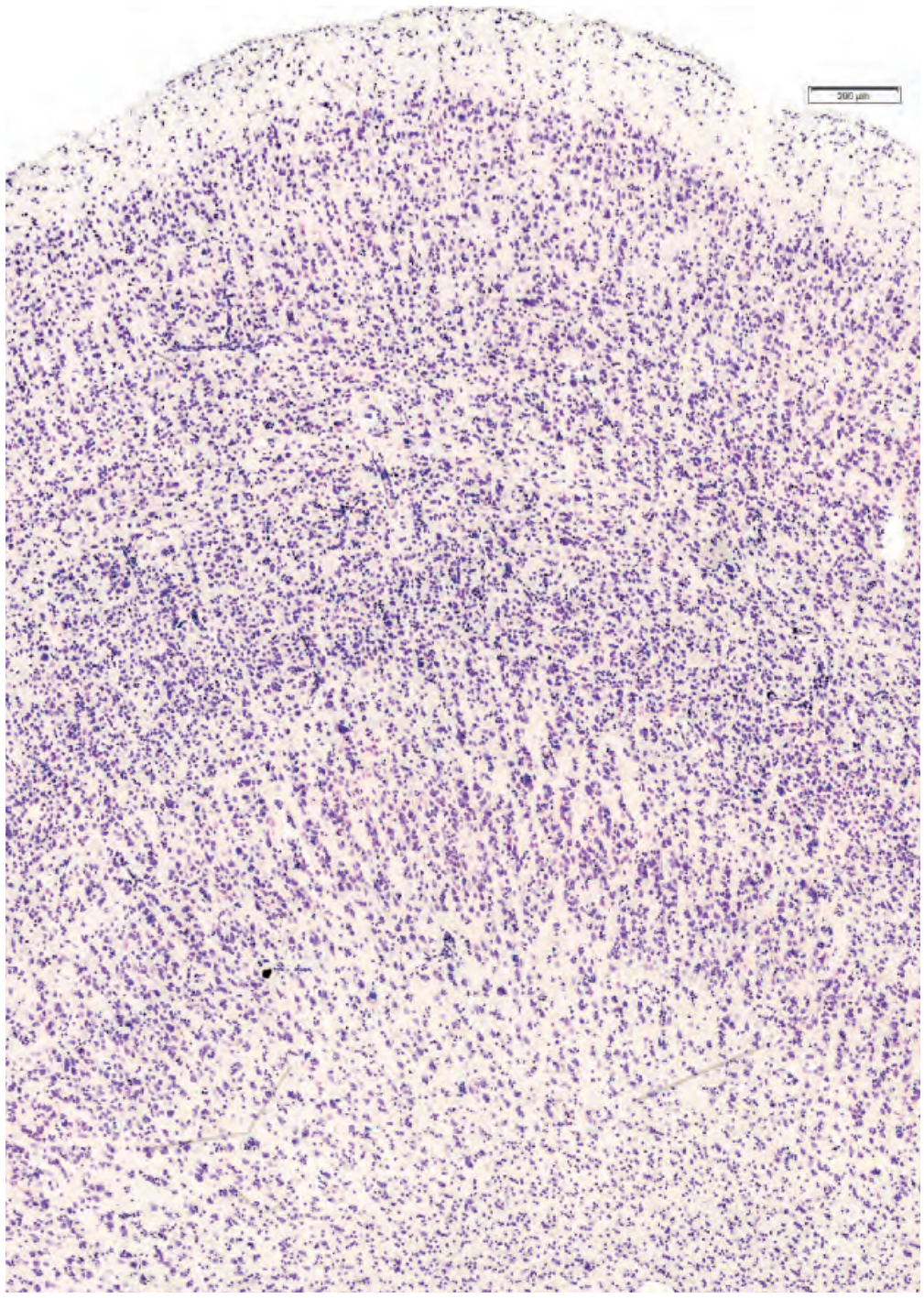
von Economo and Koskinas

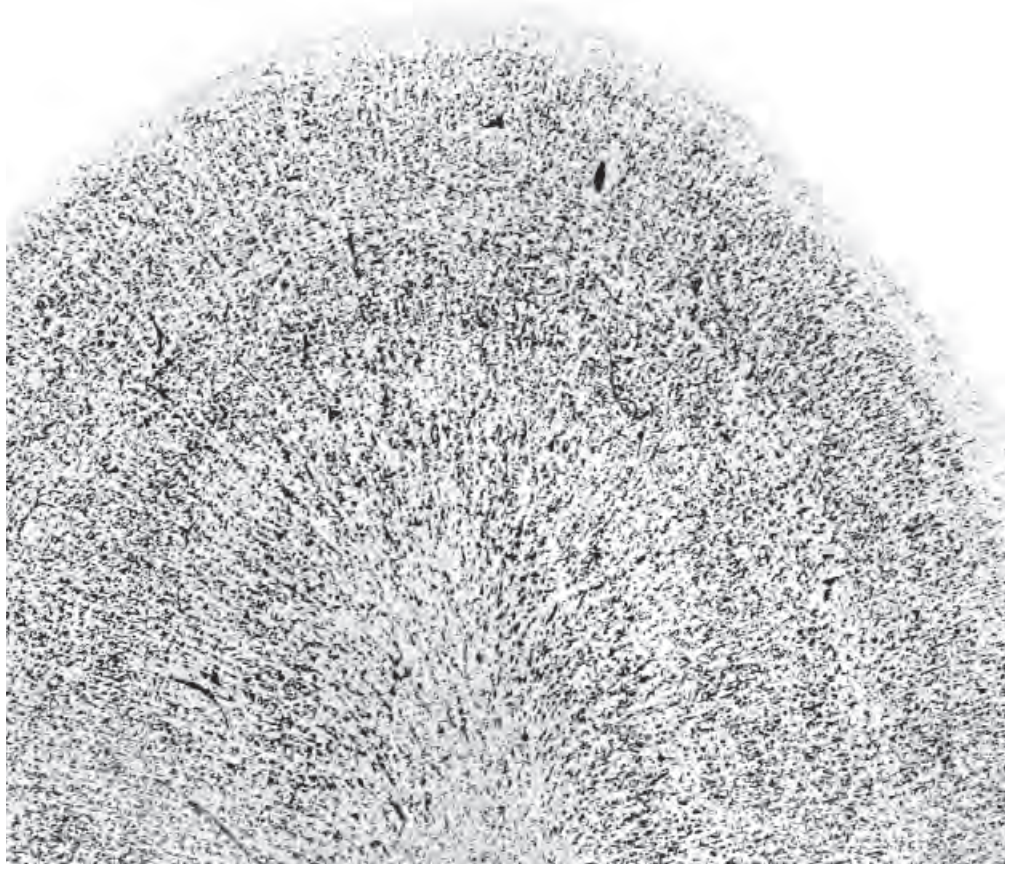
OA peristriate area
OB parastriate area
OC striate area (granulosa)

Regions of Interest

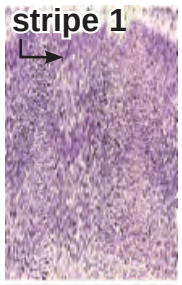
-

Cell stain (Nissl):
Section Nr. 97
Slice Nr. 6064

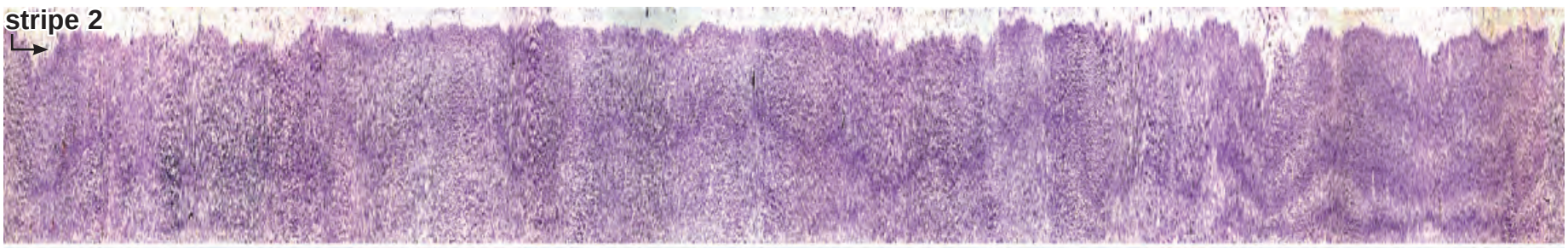




OB gamma Limes parastriatus gigantopyramidalis. OC Area striata.
von Economo and Koskinas (1925) Plate LXXXVI (86)

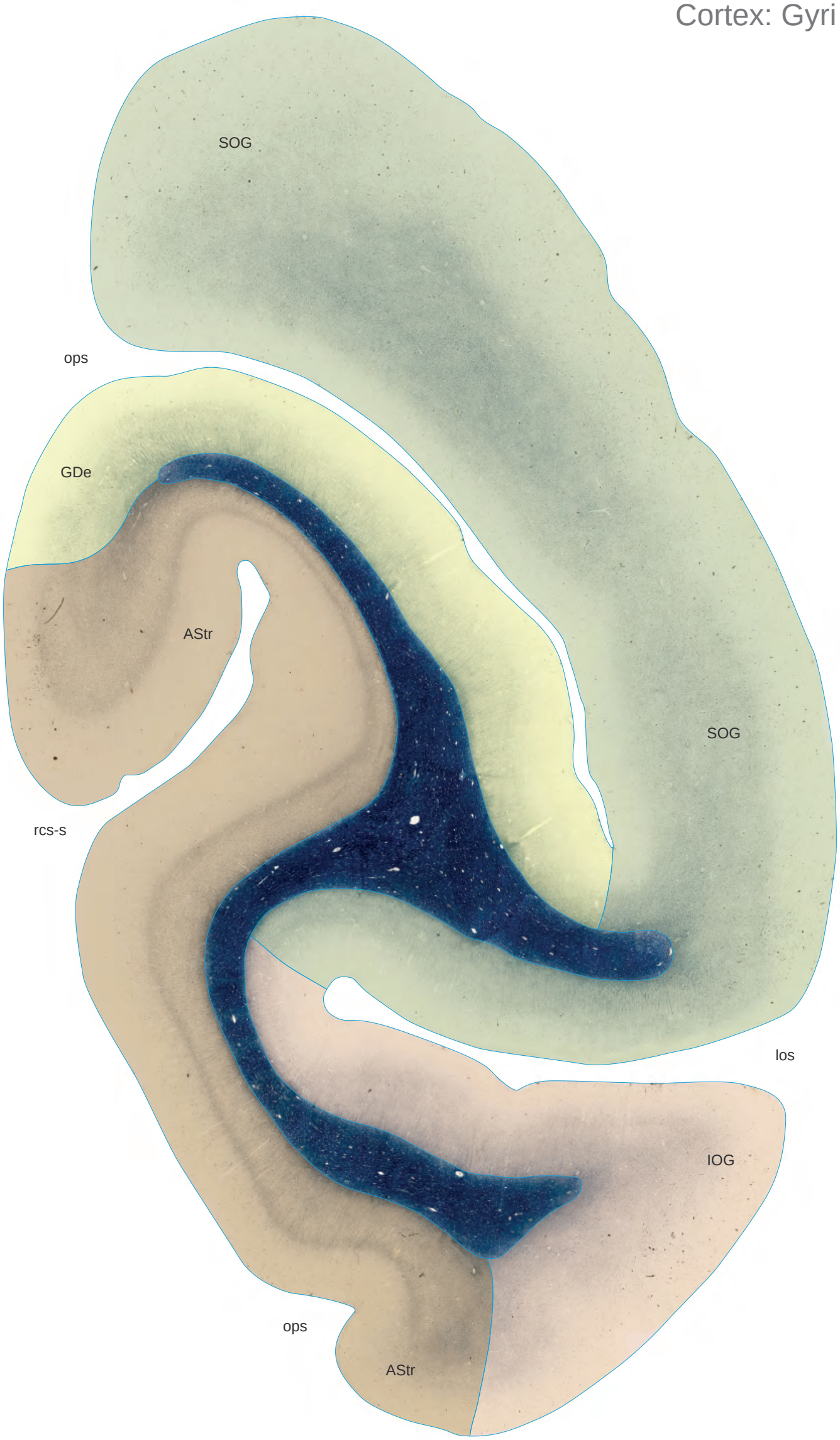


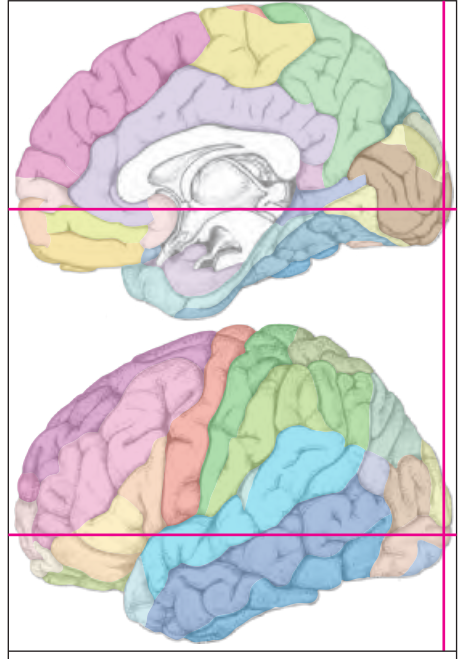
Gyral pattern	MSG
Brodmann areas	BA18
von Economo	OB
Regions of Interest	



Gyral pattern	GDe	SOG-l	SOG-m	SOG-l	IOG	FuG-p	AStr	GDe
Brodmann areas	BA18		BA19	BA18	BA19	BA18	BA17	BA18
von Economo	OB		OA	OB	OA	OB OA OB	OC	OB
Regions of Interest								

Cortex: Gyri and Sulci





MNI Position y = -104.78 mm
AHB Position y = 99.75 mm

Gyri

ASTr striate area
GDe gyrus descendens
IOG inferior occipital gyrus
SOG superior occipital gyrus

Sulci

los lateral occipital sulcus
ops occipitopolar sulcus
rcs-s retrocalcarine sulcus, superior part

Fibers

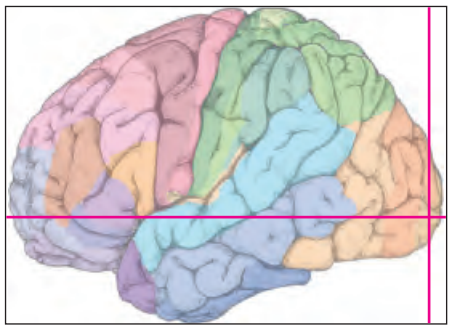
-

Fiber stain (Weigert)
Section Nr. 98
Slice Nr. 6212

Cortex: Brodmann Areas

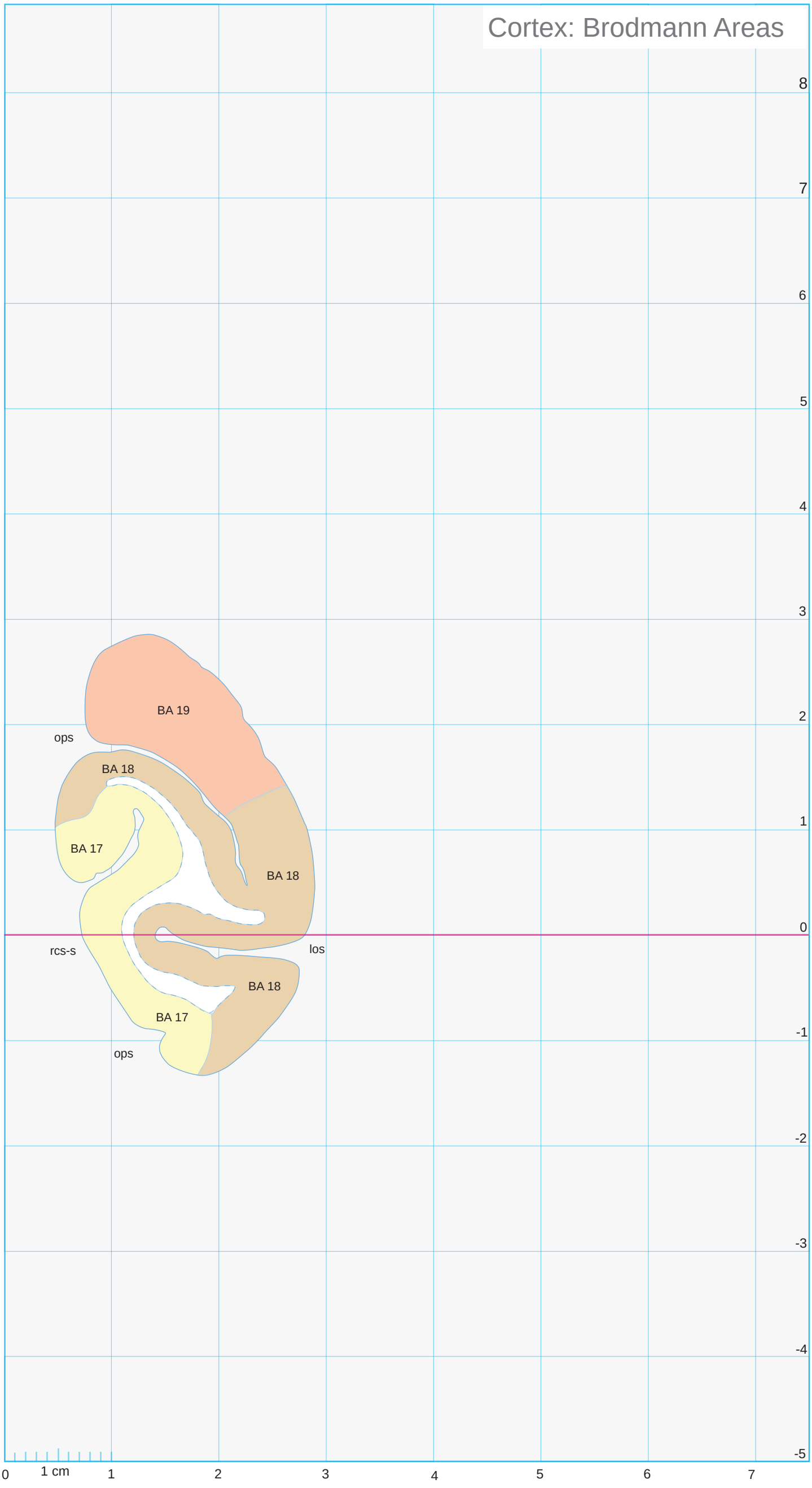
98

MNI: -104.78
ICL: 99.75
MCP: 85.01

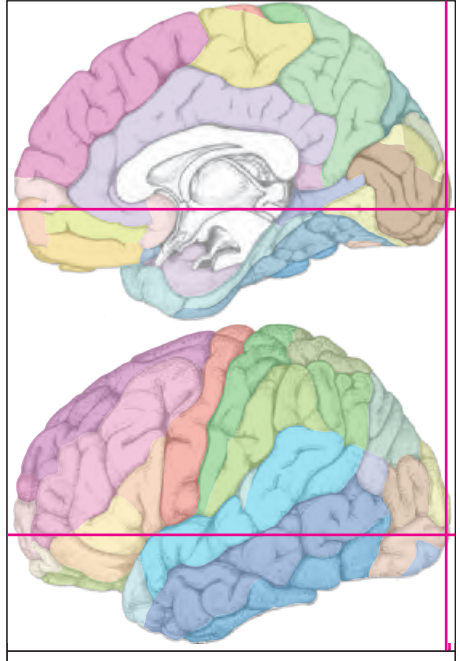


BA1-52 Brodmann areas 1-52 (see p. 101)

los lateral occipitotemporal sulcus
ops occipitopolar sulcus (extreme fissure of Seitz)
rcs-s retrocalcarine sulcus, upper branch



Cortex: Gyri and Sulci



MNI Position y = -107.62 mm
AHB Position y = 102.43 mm

Gyri

AStr striate area
IOG inferior occipital gyrus
GDe gyrus descendens

Sulci

los lateral occipital sulcus

Fibers

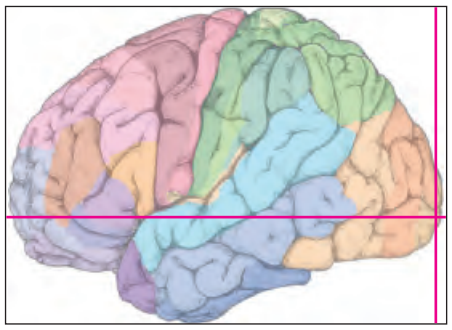
-

Fiber stain (Weigert)
Section Nr. 99
Slice Nr. 6312

Cortex: Brodmann Areas

99

MNI: -107.62
ICL: 102.43
MCP: 87.69



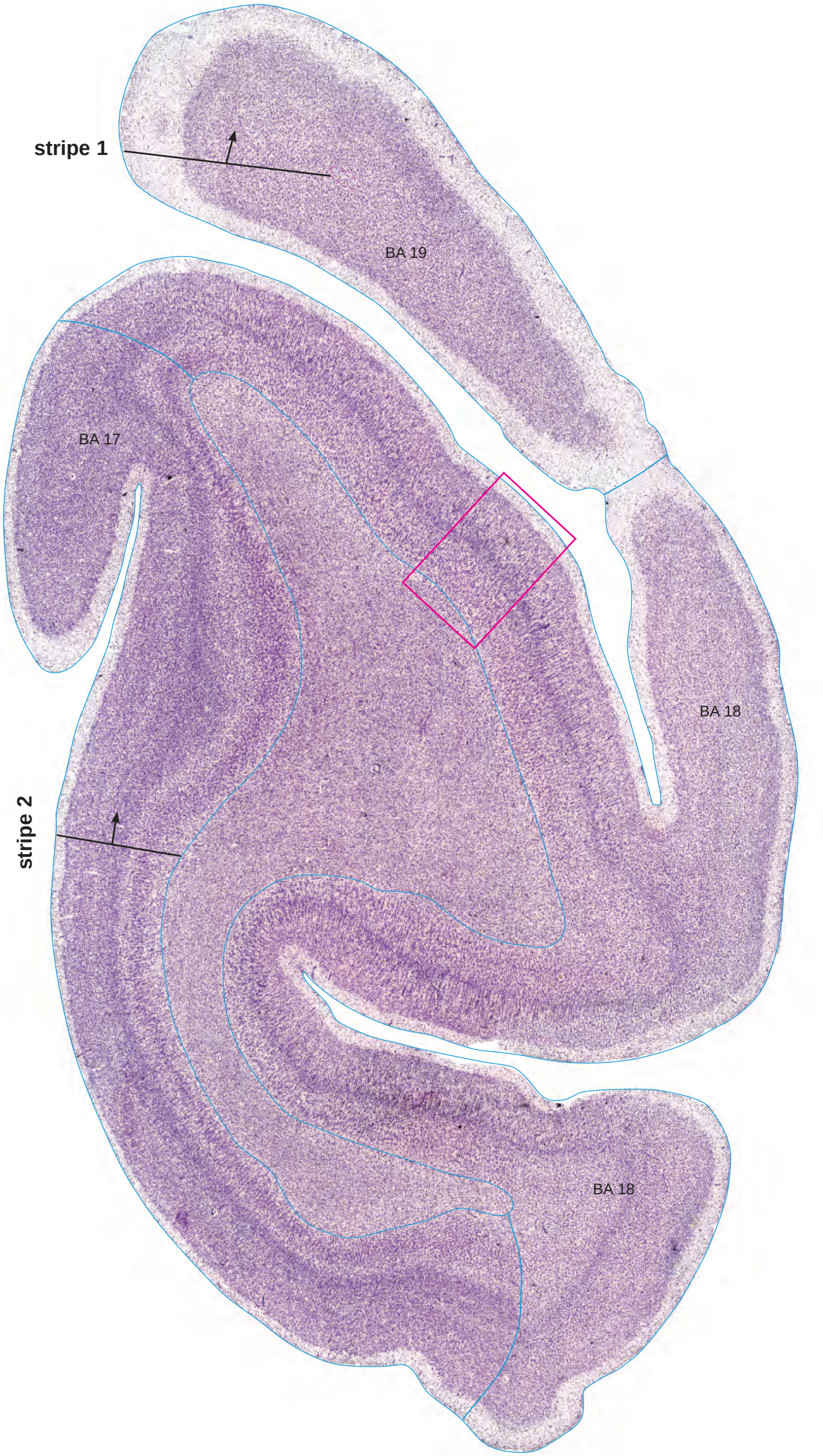
BA17,18 Brodmann areas 17,18 (see p. 101)

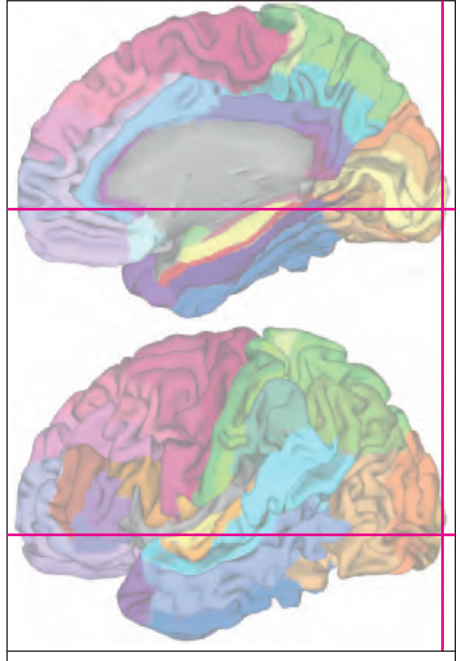
los lateral occipitotemporal sulcus

BA 17
BA 18
BA 18
los

8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5

0 1 cm 1 2 3 4 5 6 7





MNI Position y = -106.24 mm
AHB Position y = 101.15 mm

Gyral Pattern

AStr striate area
IOG inferior occipital gyrus
GDe gyrus descendens

Brodmann Areas

BA17 area striata
BA18 area occipitalis
BA19 area praeoccipitalis

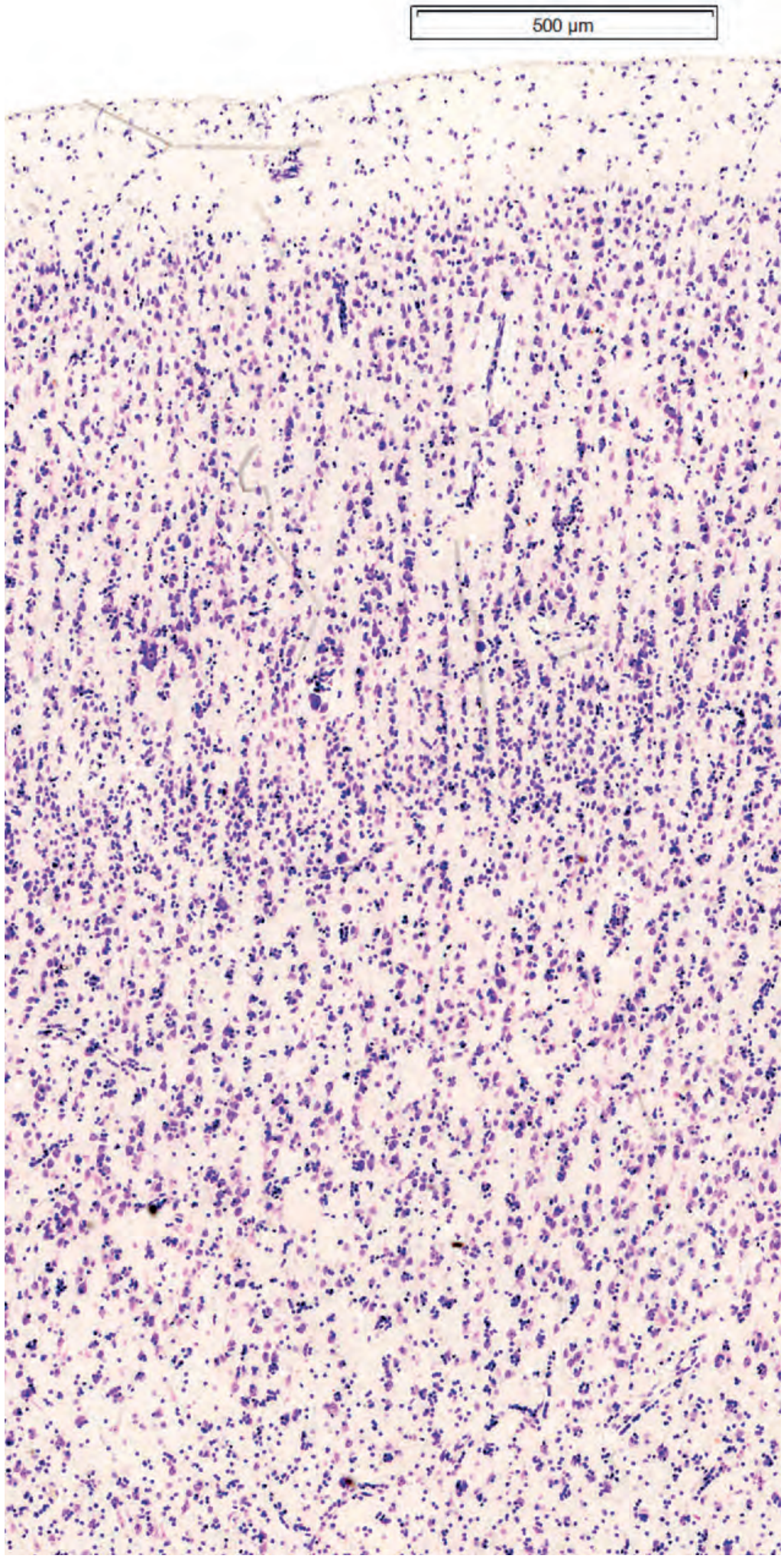
von Economo and Koskinas

OA peristriate area
OB parastriate area
OC striate area (granulosa)

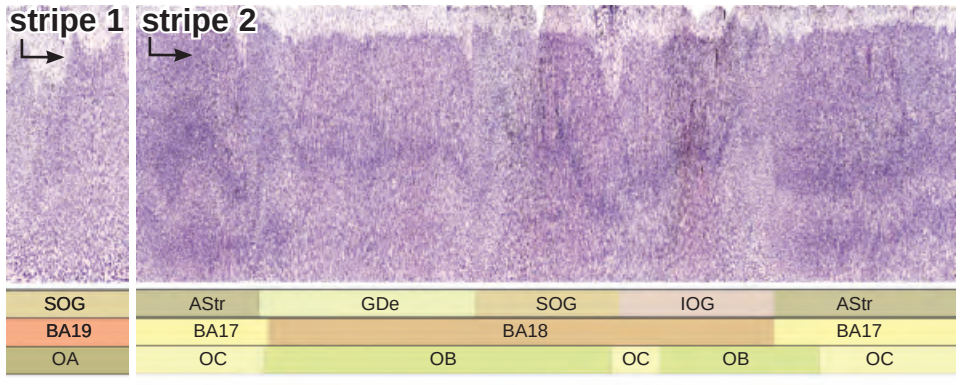
Regions of Interest

-

Cell stain (Nissl):
Section Nr. 99
Slice Nr. 6264



Gyrus descendens Ecker.
OB Area parastriata.
OC Area striata.
OB (gamma) Limes parastriatus gigantopyramidalis.
von Economo and Koskinas (1925) Plate LXXXVII (87)



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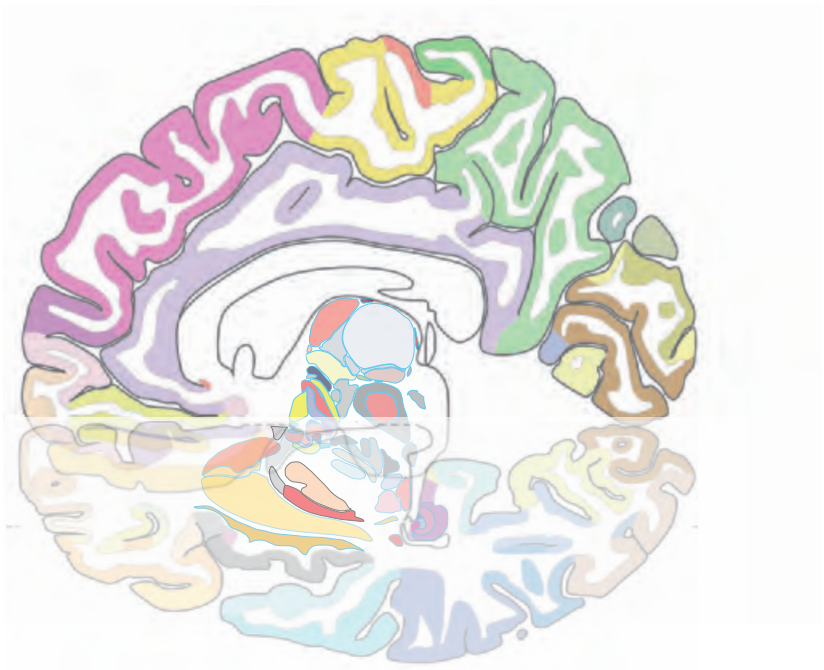
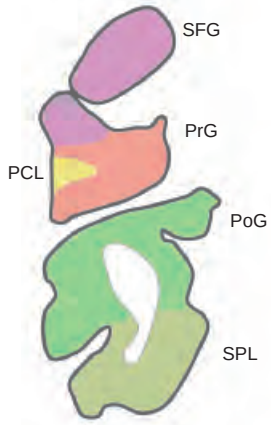
2.4 Horizontal and Sagittal Diagrams with Reduced Detail



The diagrams of the sections in the axial and sagittal planes were produced from the 3D reconstruction of the *Atlas* brain in the MNI space using the methodology described in section 2.1.10. The distance between the axial sections is 4 mm and in the sagittal series 4 mm.

Since the contour lines defining the pial and ventricular surfaces of the brain as well as the subcortical structures were automatically generated the plates may be more thoroughly checked if stereotaxic applications are intended.

Fig.: A-1
Position z = 84.00 mm



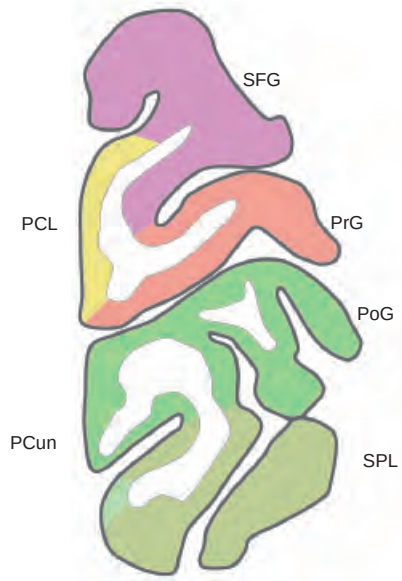
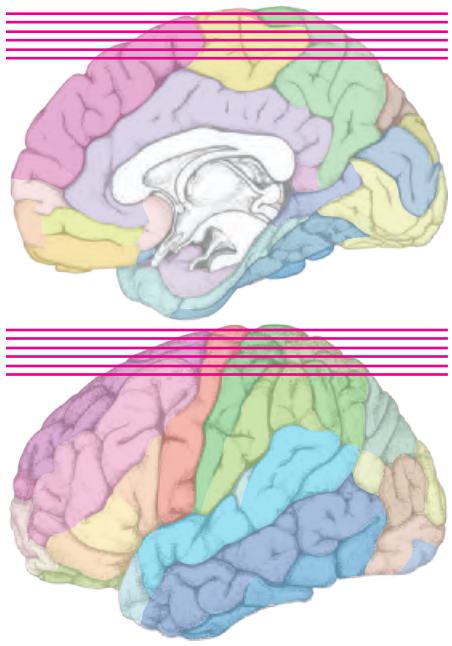


Fig.: A-2
Position z = 80.00 mm



AAnG angular gyrus, anterior division
MFG middle frontal gyrus
PAnG posterior angular gyrus
PCL paracentral lobule
PCun precuneus
PoG postcentral gyrus
PrG precentral gyrus
SFG superior frontal gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial division
SMG supramarginal gyrus
SPL superior parietal lobule

Fig.: A-3
Position z = 76.00 mm

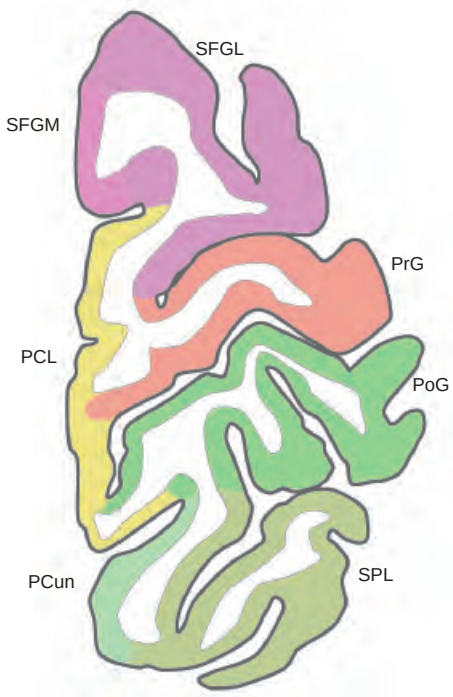


Fig.: A-4
Position z = 72.00 mm

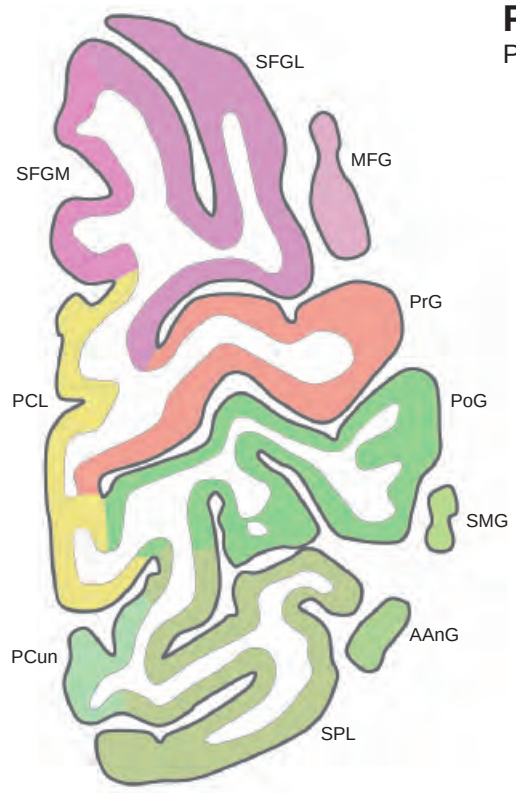


Fig.: A-5
Position z = 68.00 mm

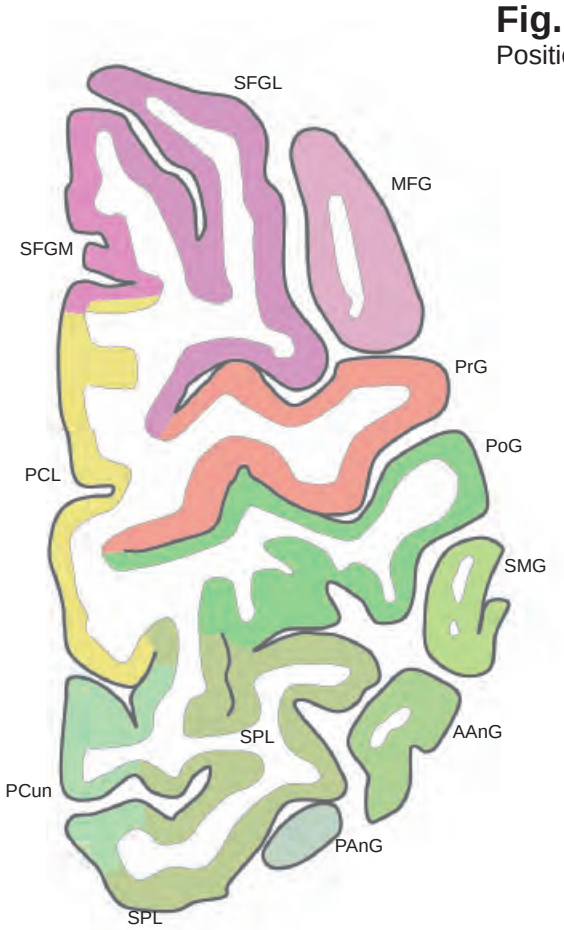
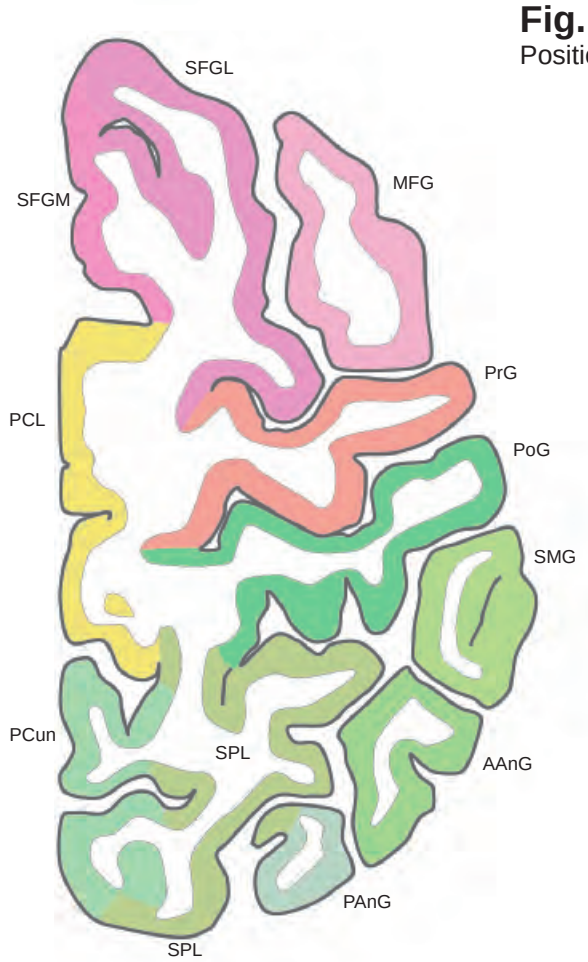


Fig.: A-6
Position z = 64.00 mm



1 cm

Fig.: A-7
Position z = 60.00 mm

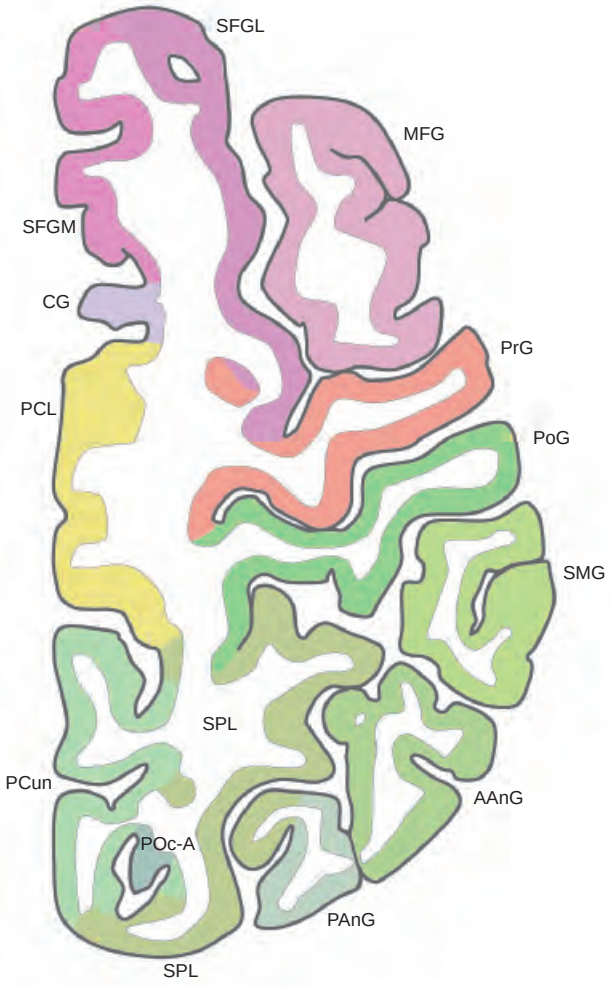
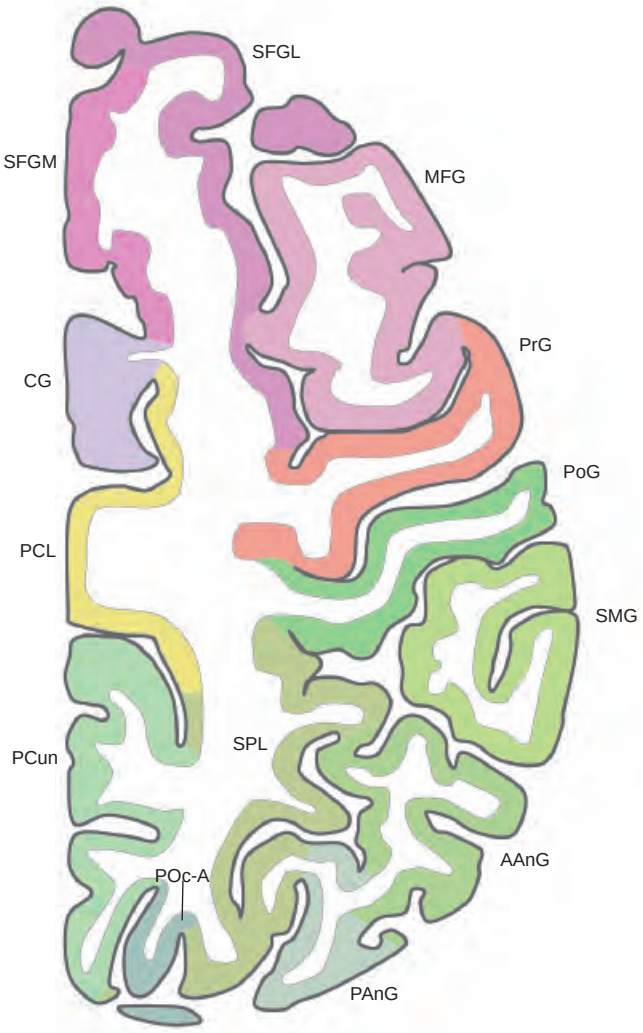
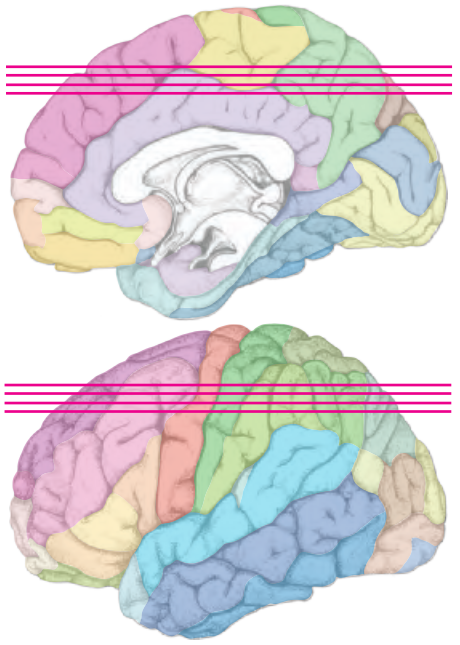


Fig.: A-8
Position z = 56.00 mm





AAnG angular gyrus, anterior division
CG cingulate gyrus
MFG middle frontal gyrus
PAnG posterior angular gyrus
PCL paracentral lobule
PCun precuneus
POc-A parieto-occipital arc, anterior part
POc-P parieto-occipital arc, posterior part
PoG postcentral gyrus
PrG precentral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial division
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus

Fig.: A-9
Position z = 52.00 mm

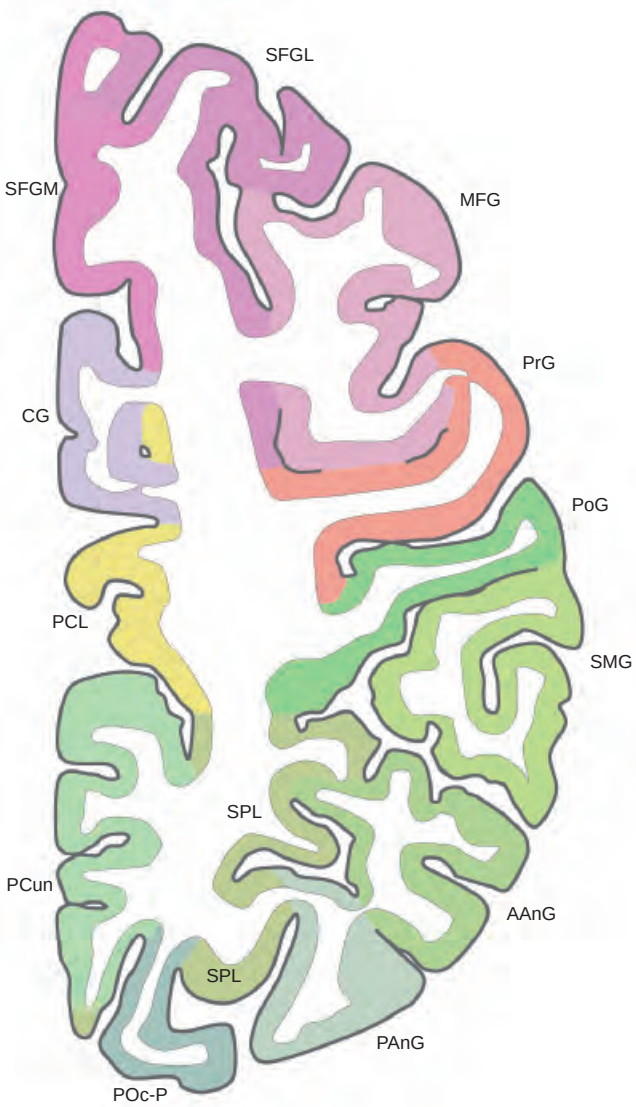
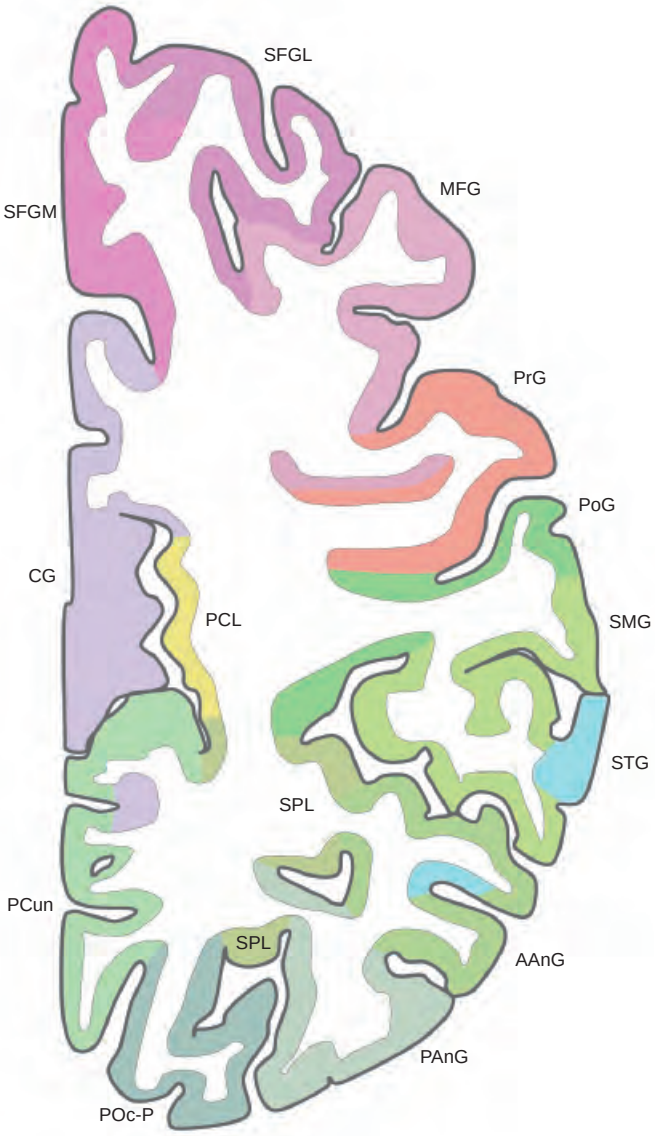


Fig.: A-10
Position z = 48.00 mm



1 cm

Fig.: A-11
Position z = 44.00 mm

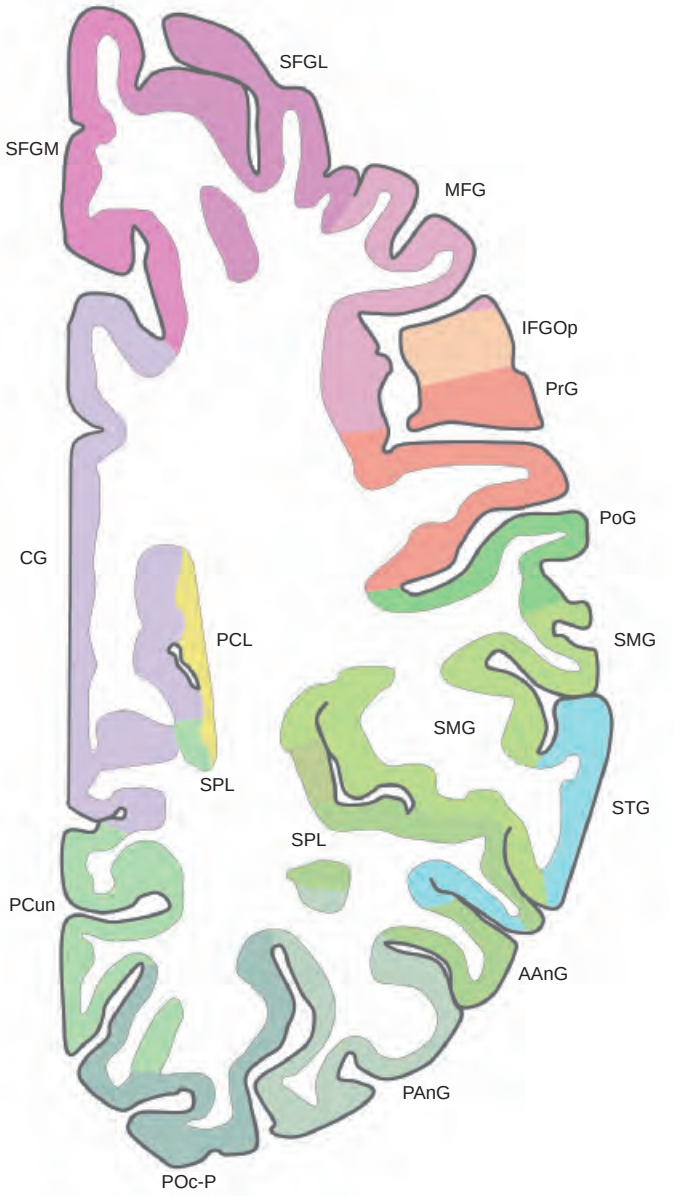
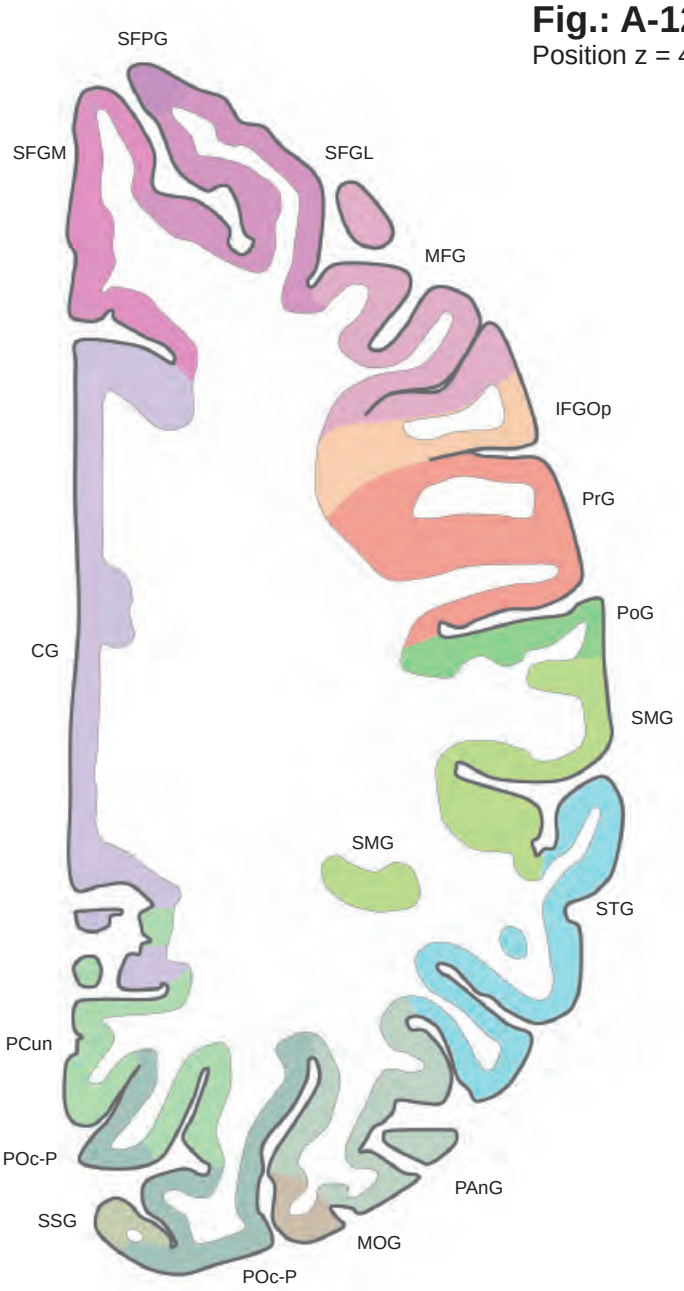
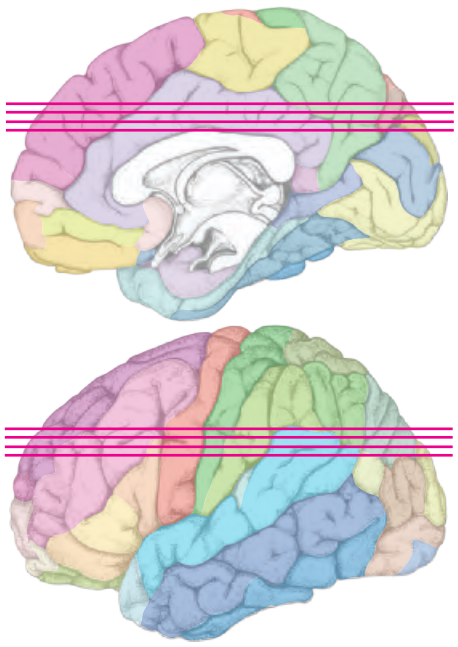


Fig.: A-12
Position z = 40.00 mm





AAnG angular gyrus, anterior division
Cd caudate nucleus
CG cingulate gyrus
COp-p posterior central operculum
IFGOp inferior frontal gyrus, opercular part
Ins insula
MFG middle frontal gyrus
MOG middle occipital gyrus
MSG middle sagittal gyrus
PAnG posterior angular gyrus
PCL paracentral lobule
PCun precuneus
POc-P parieto-occipital arc, posterior part
PoG postcentral gyrus
POp parietal operculum
PrG precentral gyrus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial division
SFPG superior frontopolar gyrus
SMG supramarginal gyrus
SOG superior occipital gyrus
SPL superior parietal lobule
SSG superior sagittal gyrus
STG superior temporal gyrus
TOTZ temporooccipital transition zone
TTG2 post. transverse temporal gyrus

Fig.: A-13
Position z = 36.00 mm

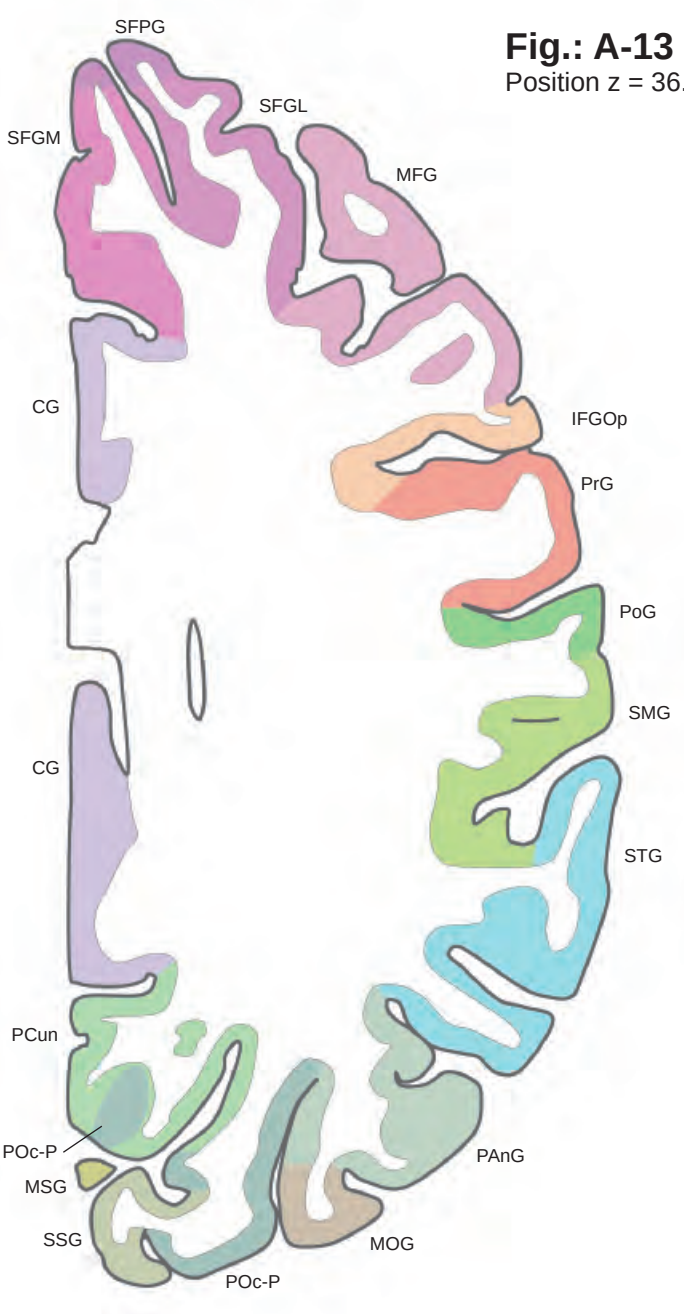
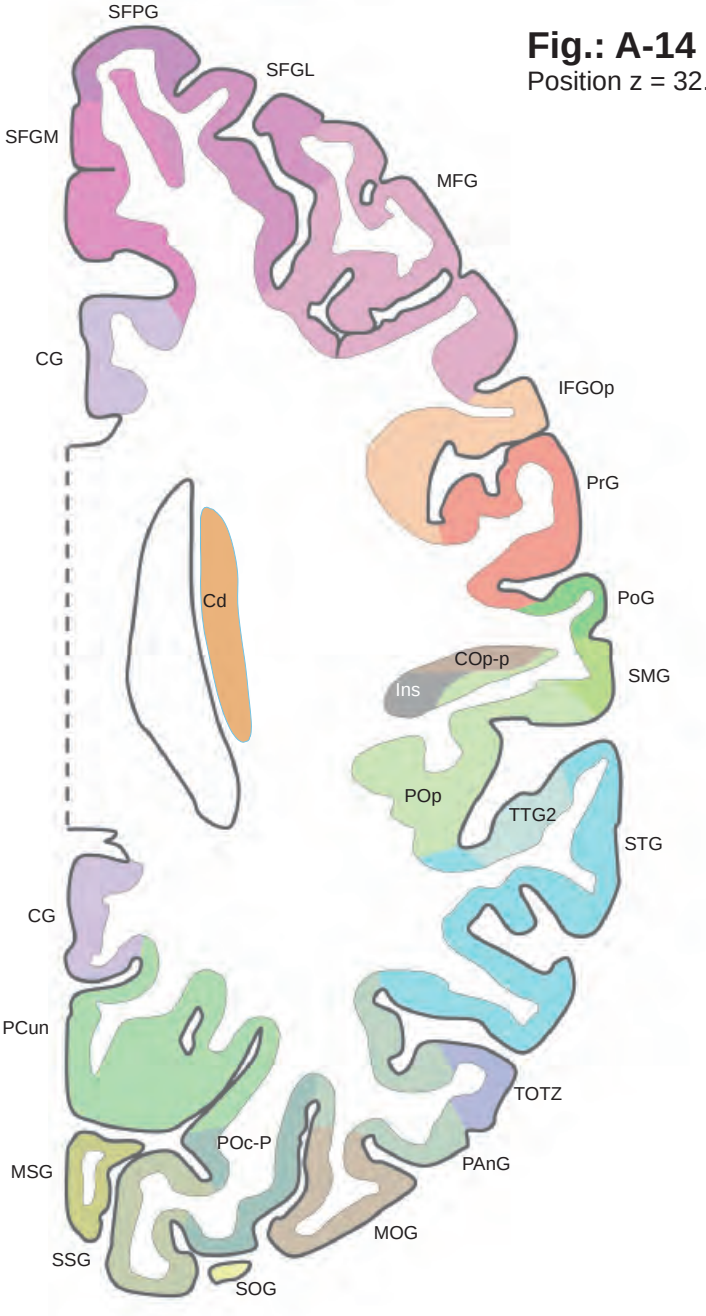


Fig.: A-14
Position z = 32.00 mm



1 cm

Fig.: A-15
Position z = 28.00 mm

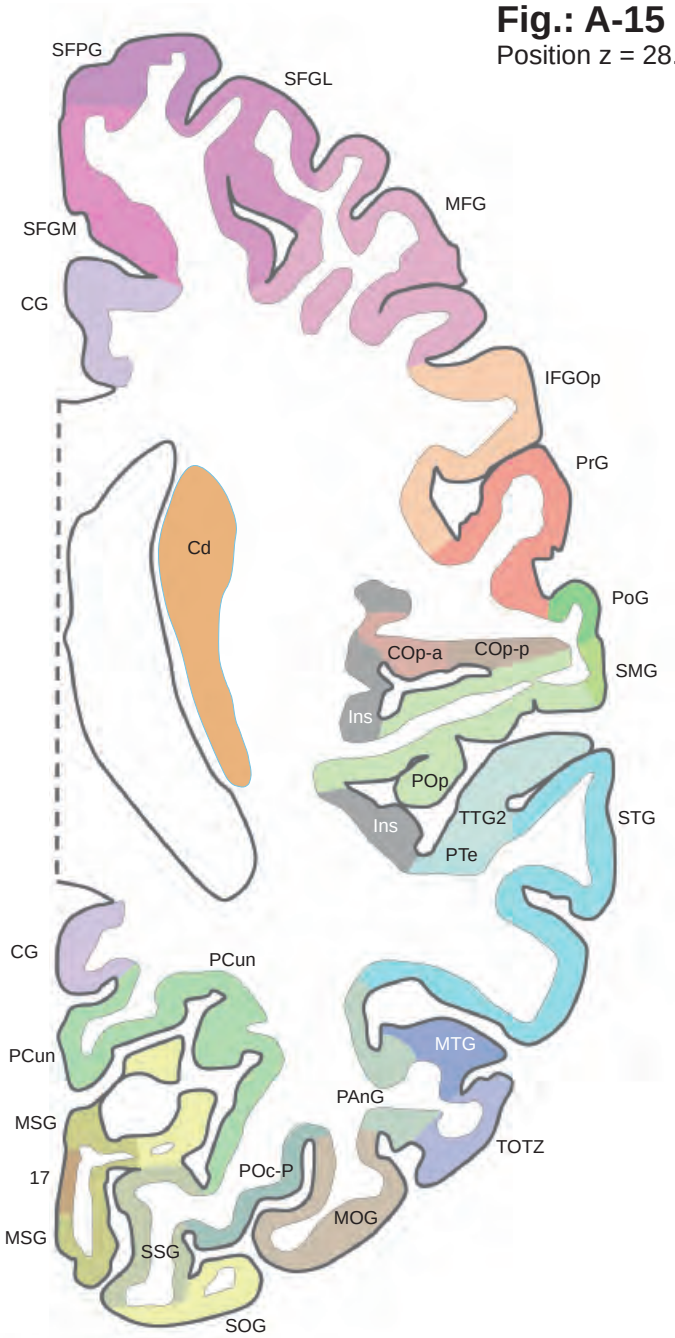
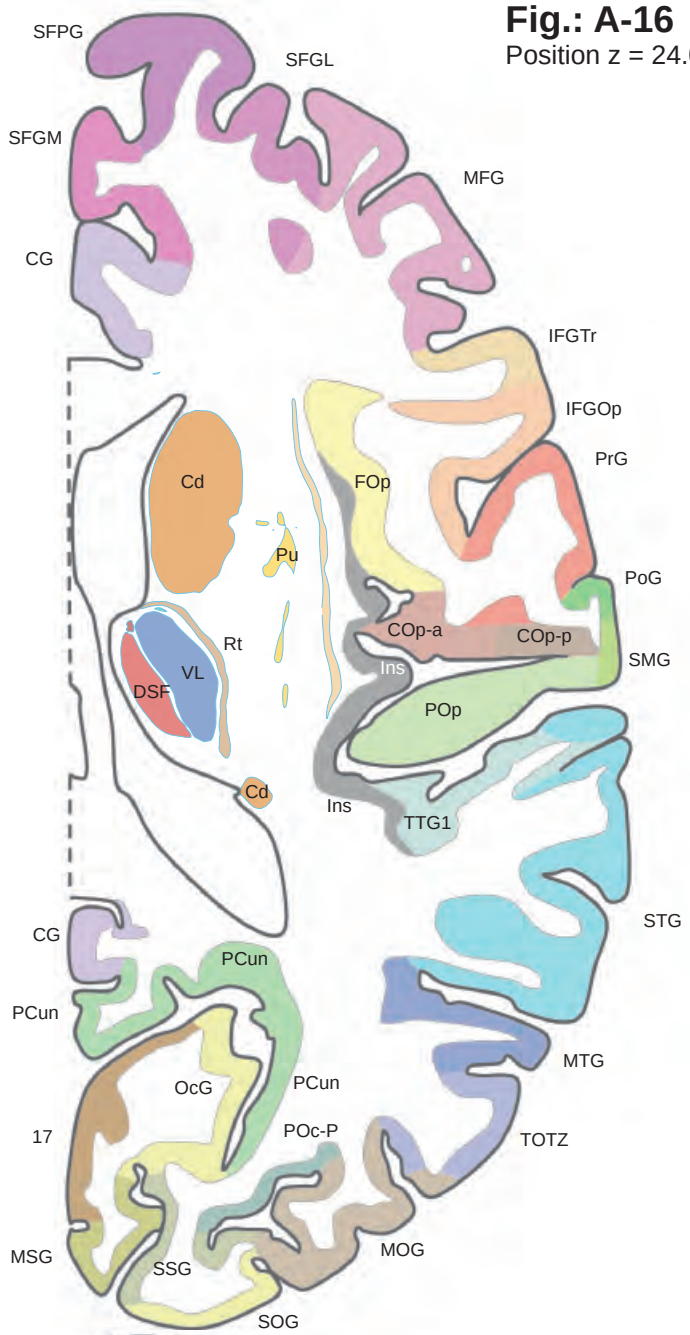


Fig.: A-16
Position z = 24.00 mm



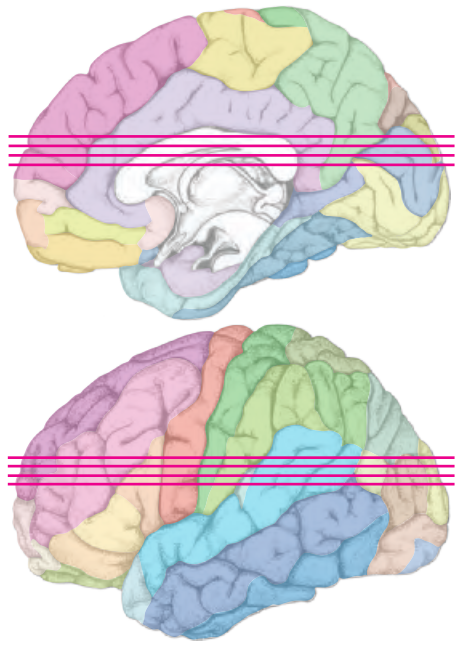


Fig.: A-17
Position z = 20.00 mm

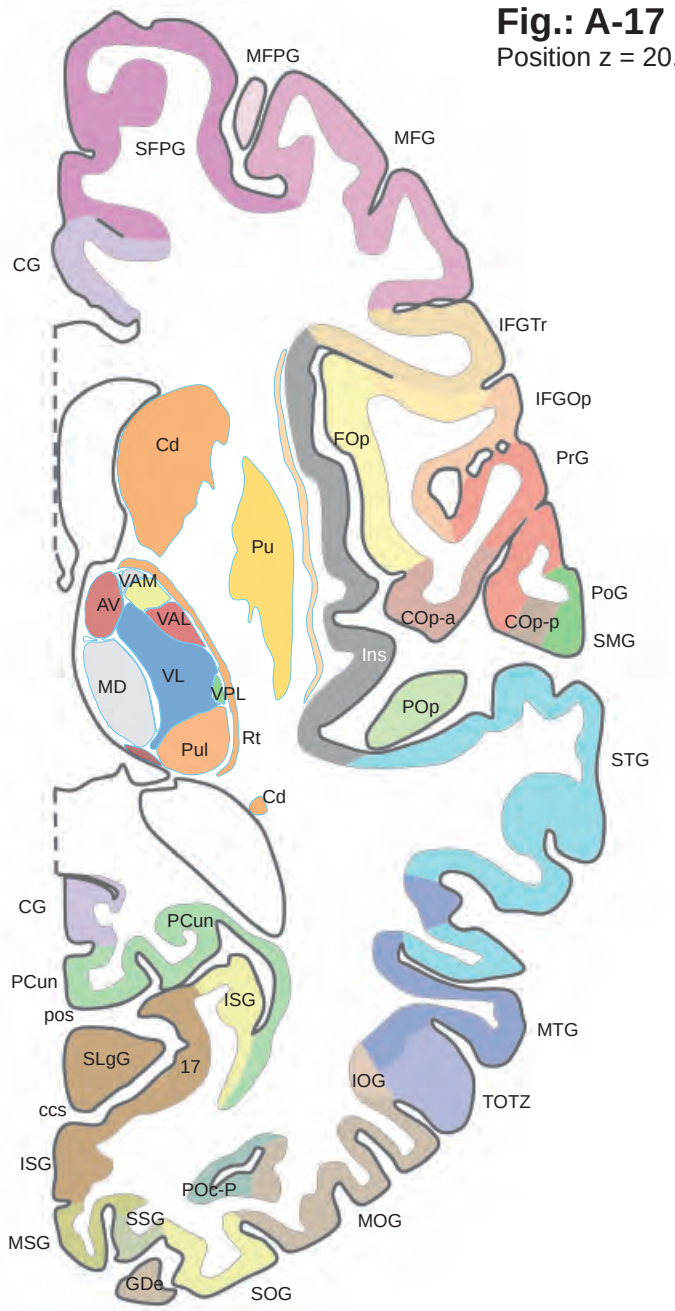
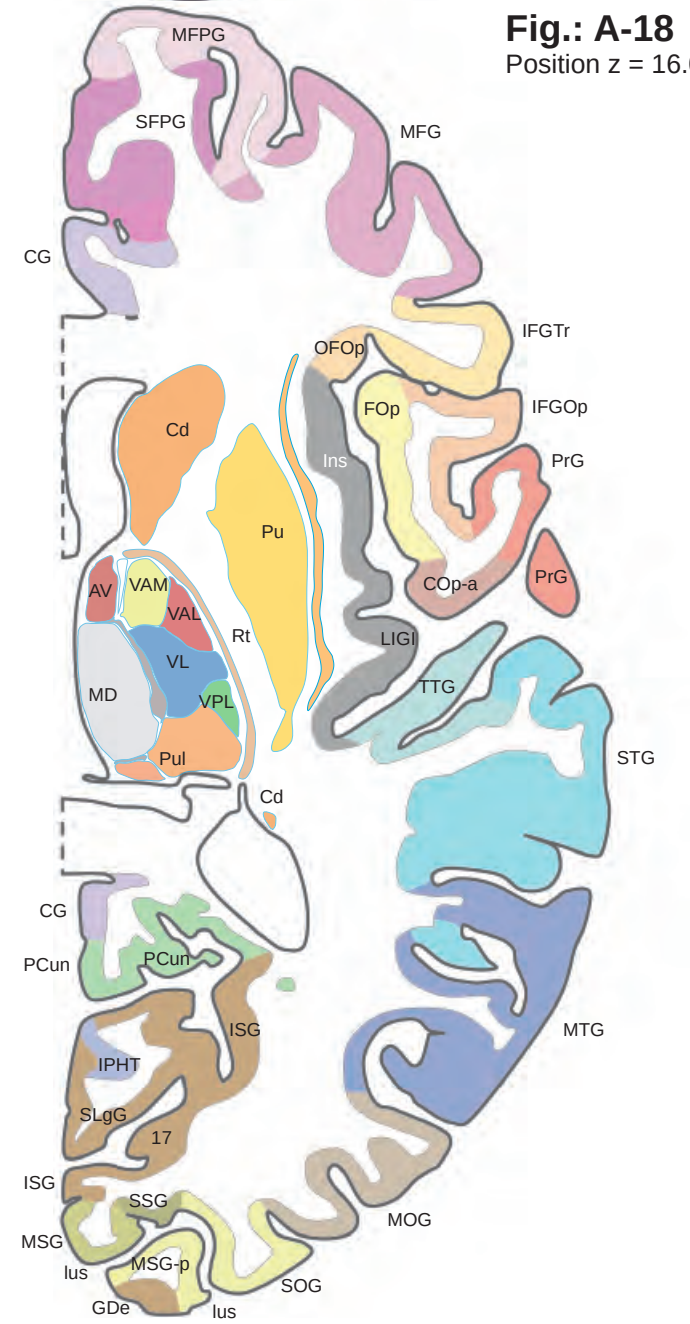


Fig.: A-18
Position z = 16.00 mm



1 cm

17 striate area
AV anteroventral thalamic nucleus
ccs calcarine sulcus, central part
Cd caudate nucleus
CG cingulate gyrus
COp-a anterior central operculum
COp-p posterior central operculum
DSF dorsal superficial nucleus
FOp frontal operculum
GDe gyrus descendens
IFGOp inferior frontal gyrus, opercular part
IFGTr inferior frontal gyrus, triangular part
Ins insula
IOG inferior occipital gyrus
IPHT isthmo-parahippocampal transition
ISG inferior sagittal gyrus
LIGl long insular gyrus I
lus lunate sulcus
MD medial dorsal thalamic nucleus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOG middle occipital gyrus
MSG middle sagittal gyrus
MSG-p middle sagittal gyrus, posterior part
MTG middle temporal gyrus
OcG occipital gyrus
OFOp orbitofrontal operculum
PAnG posterior angular gyrus
PCun precuneus
POc-P parieto-occipital arc, posterior part
PoG postcentral gyrus
POp parietal operculum
pos parieto-occipital sulcus
PrG precentral gyrus
PTe planum temporale
Pu putamen
Pul pulvinar
Rt reticular thalamic nucleus
SFGL superior frontal gyrus, lateral part
SFGM superior frontal gyrus, medial division
SFPG superior frontopolar gyrus
SLgG superior lingual gyrus
SMG supramarginal gyrus
SOG superior occipital gyrus
SSG superior sagittal gyrus
STG superior temporal gyrus
TOTZ temporooccipital transition zone
TTG transverse temporal gyrus
TTG1 ant. transverse temporal gyrus
TTG2 post. transverse temporal gyrus
VAL lateral ventroanterior nucleus
VAM medial ventroanterior nucleus
VL ventrolateral thalamic nucleus
VPL ventroposterior lateral thalamic nucleus

Fig.: A-19
Position z =12.00 mm

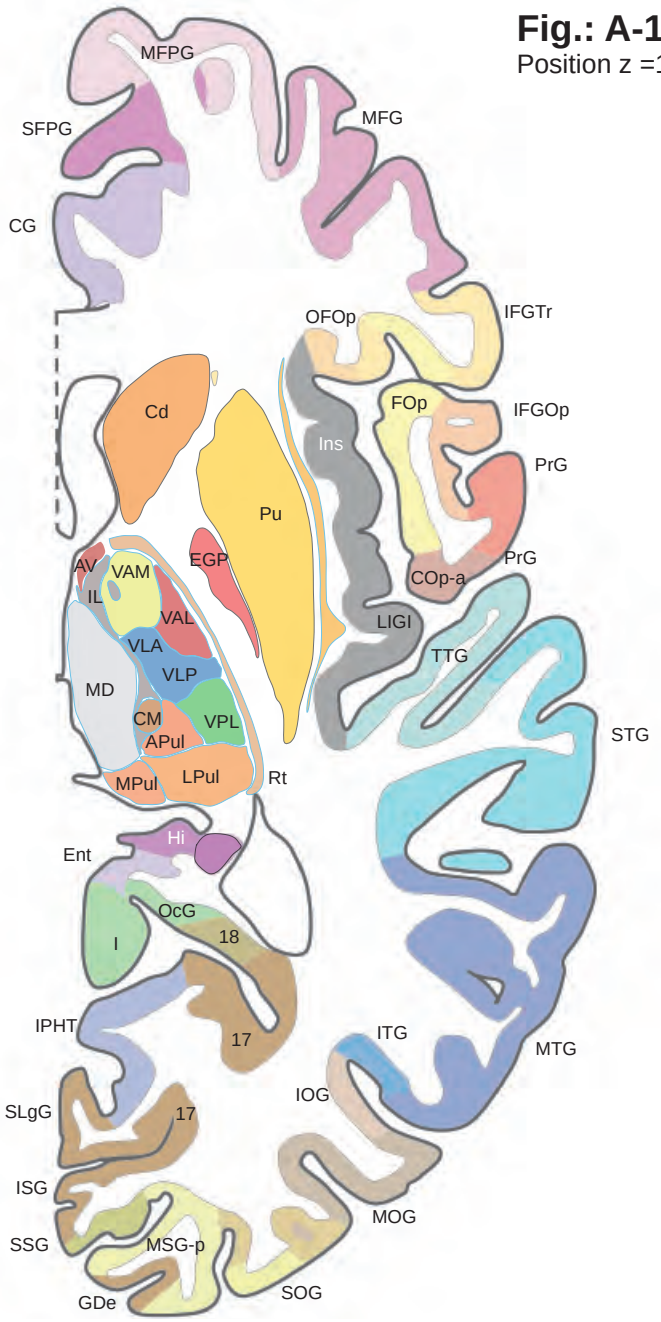
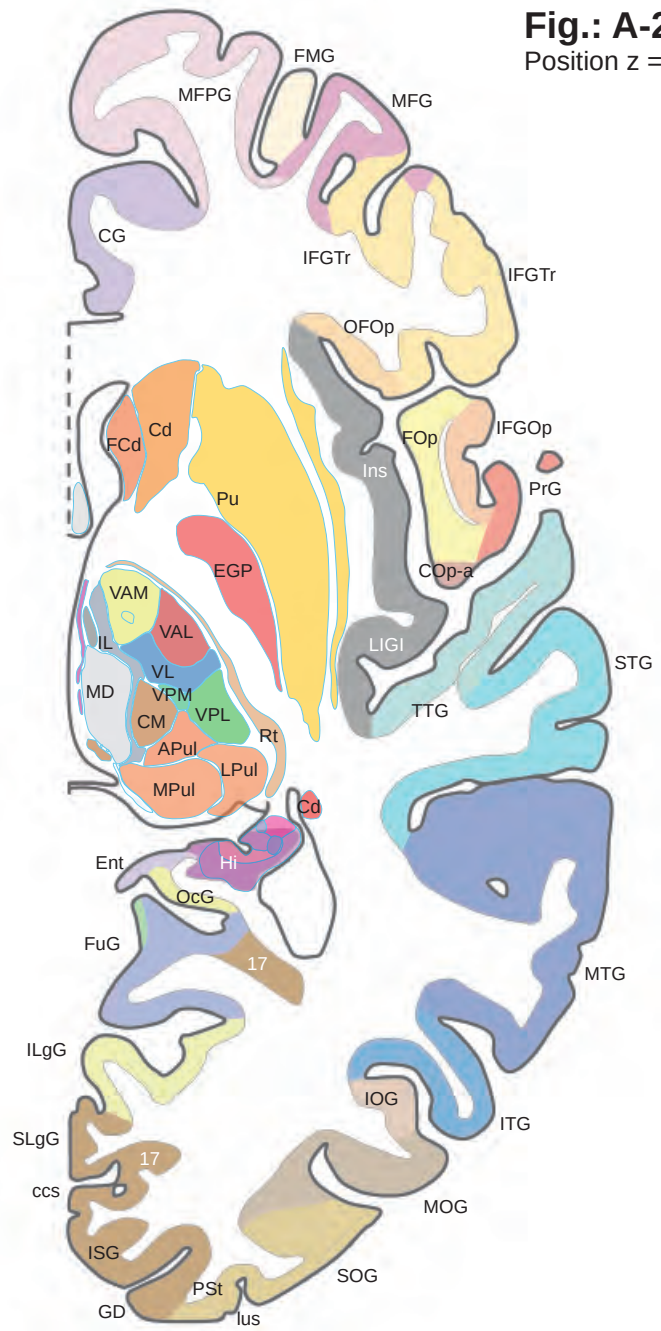


Fig.: A-20
Position z = 8.00 mm



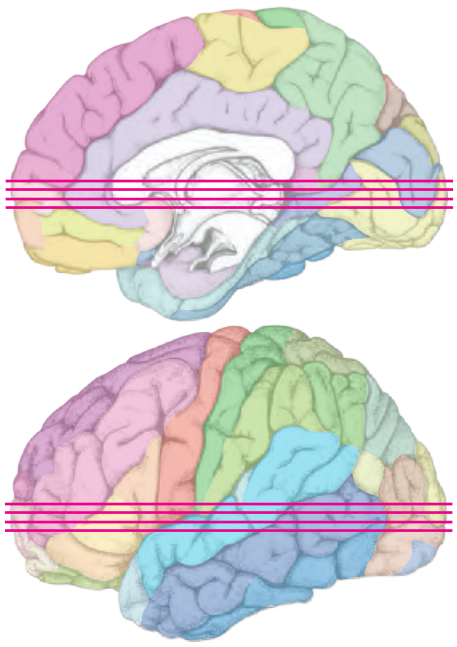


Fig.: A-21
Position z = 4.00 mm

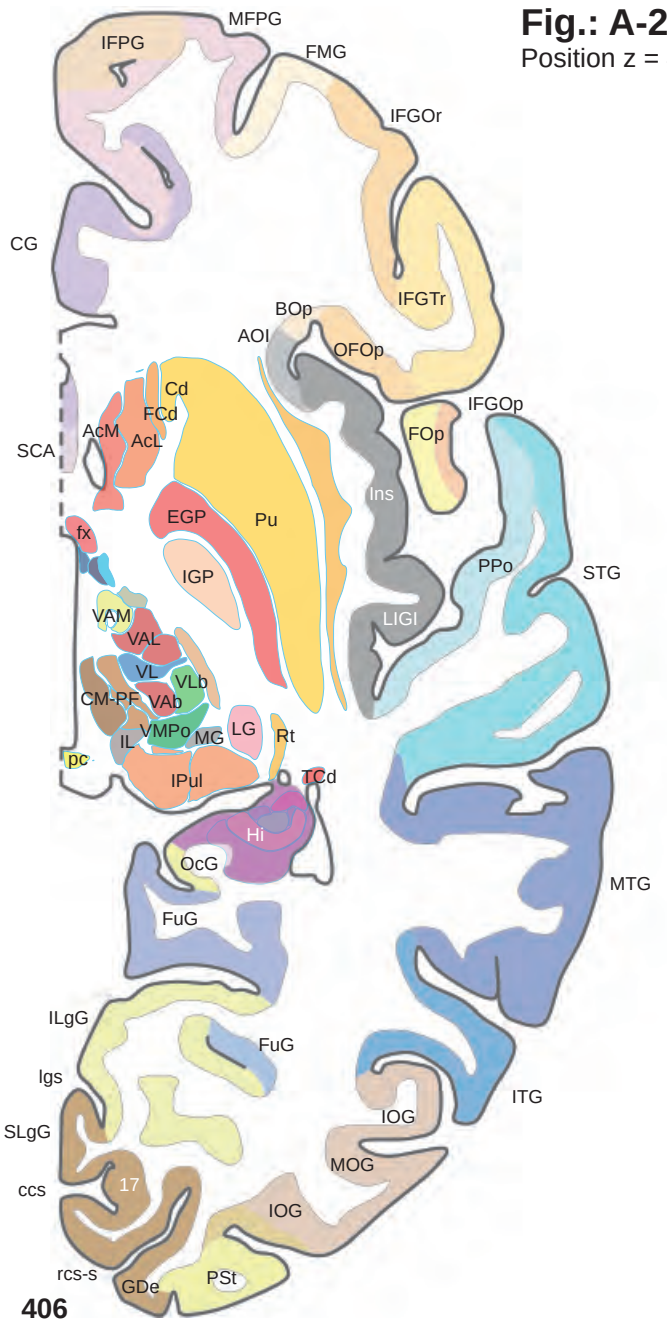
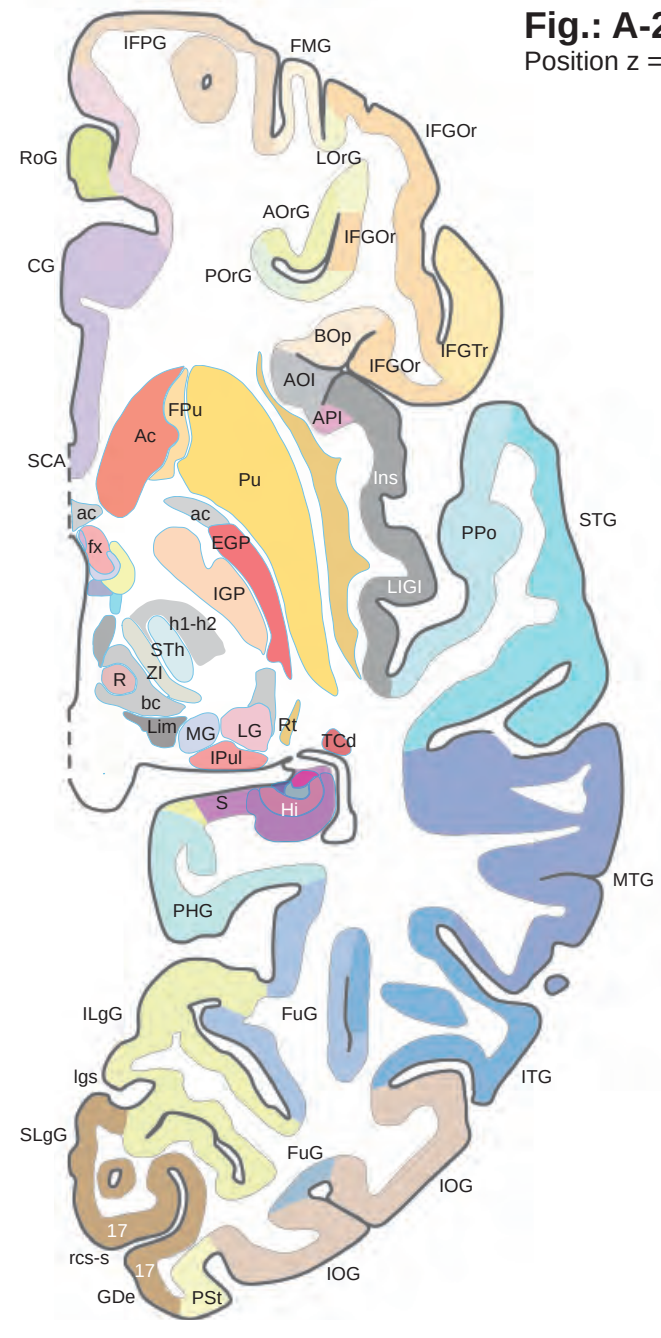


Fig.: A-22
Position z = 0.00 mm



1 cm

ac anterior commissure
Ac accumbens nucleus
AcL accumbens nucleus, lateral part
AcM accumbens nucleus, medial part
AOI area orbitoinsularis
AOrG anterior (intermediate) orbital gyrus
API area piriformis insulae
APul anterior pulvinar nucleus
AV anteroventral thalamic nucleus
bc brachium conjunctivum
BOp basal operculum
ccs calcarine sulcus, central part
Cd caudate nucleus
CG cingulate gyrus
CM centromedian thalamic nucleus
CM-PF centromedian-parafascicular nucleus
COp-a anterior central operculum
EGP external globus pallidus
Ent entorhinal gyrus
FCd fundus region of caudate nucleus
FMG frontomarginal gyrus
FOp frontal operculum
FPu fundus region of putamen
FuG fusiform gyrus
GDe gyrus descendens (Ecker)
h1 thalamic fascicle
Hi hippocampus
I isthmus
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
IFPG inferior frontopolar gyrus
IGP internal globus pallidus
IL intralaminar nuclei and lamina
ILgG inferior lingual gyrusiml-IL
Ins insula
IOG inferior occipital gyrus
IPHT isthmo-parahippocampal transition
IPul inferior pulvinar nucleus
ISG inferior sagittal gyrus
ITG inferior temporal gyrus
LG lateral geniculate nucleus
lgs lingual sulcus
LIGI long insular gyrus I
Lim limitans nucleus
LOrG lateral orbital gyrus
LPul lateral pulvinar nucleus
lus lunate sulcus
MD medial dorsal thalamic nucleus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MG medial geniculate nucleus
MOG middle occipital gyrus
MPul medial pulvinar nucleus
MSG-p middle sagittal gyrus, posterior part
MTG middle temporal gyrus
OcG occipital gyrus
OFOp orbitofrontal operculum
pc posterior commissure
PHG parahippocampal gyrus
POrG posterior orbital gyrus
PPo planum polare
PrG precentral gyrus
PSt parastriate area
Pu putamen
rcs-s retrocalcarine sulcus, superior branch
RoG rostral gyrus
Rt reticular thalamic nucleus
SCA subcallosal area
SFPG superior frontopolar gyrus
SLgG superior lingual gyrus
SOG superior occipital gyrus
SSG superior sagittal gyrus
STG superior temporal gyrus
STh subthalamic nucleus
S subiculum
TCd tail of caudate nucleus
TTG ant. transverse temporal gyrus 1
VAL lateral ventroanterior nucleus
VAM medial ventroanterior nucleus
VL ventrolateral thalamic nucleus
VLb basal ventrolateral thalamic nucleus
VLA anterior ventrolateral thalamic nucleus
VLP posterior ventrolateral thalamic nucleus
VPb basal ventrolateral thalamic nucleus
VPL lateral ventroposterior thalamic nucleus
VPM medial ventroposterior thalamic nucleus
ZI zona incerta

Fig.: A-23
Position z = -4.00 mm

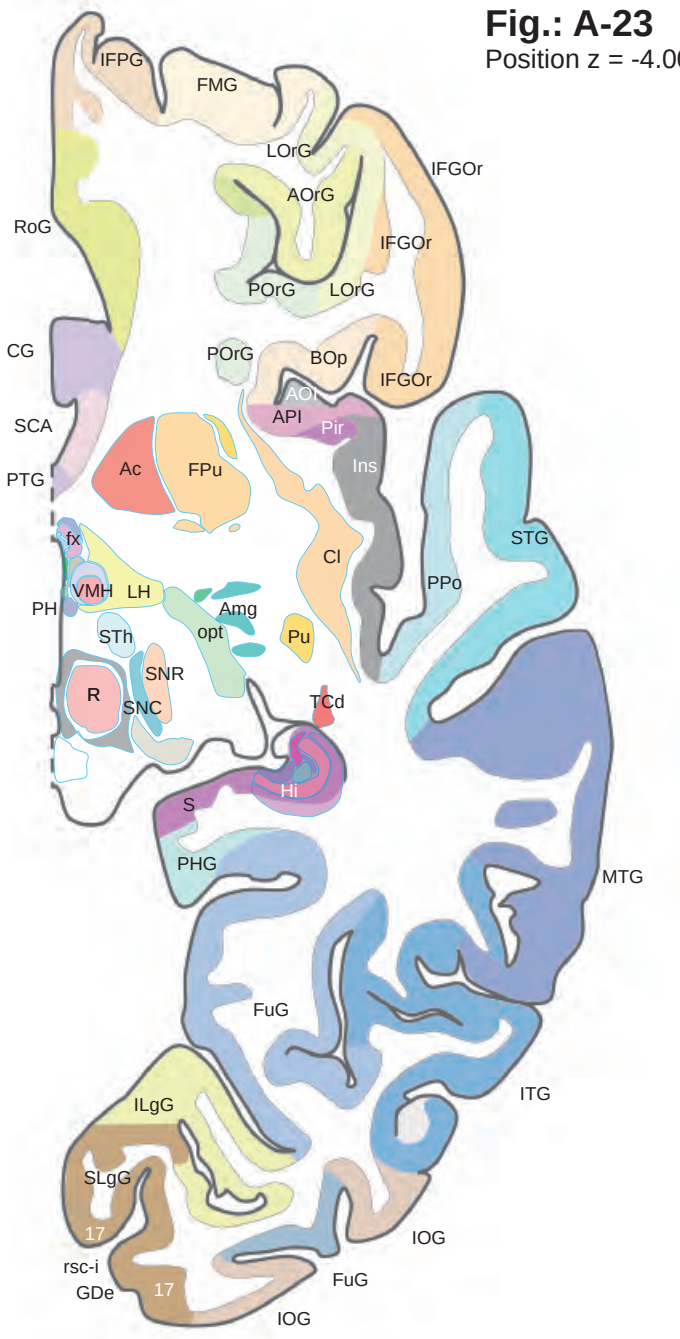
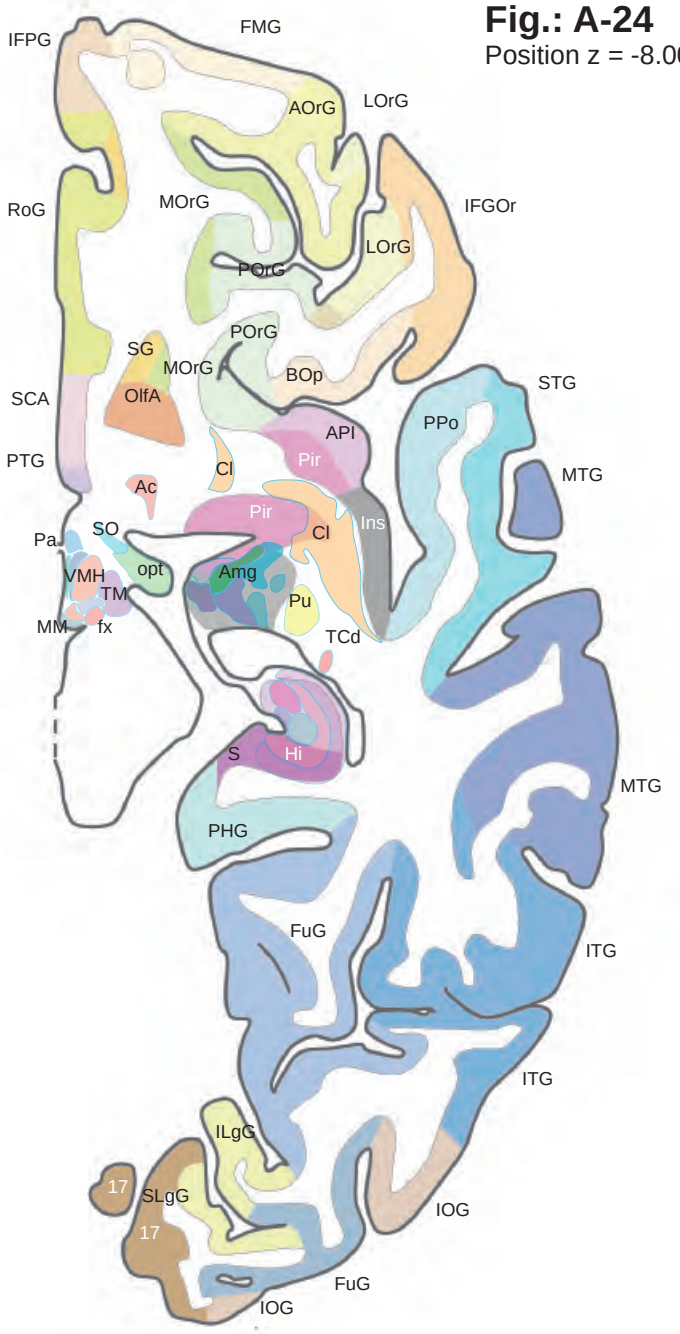


Fig.: A-24
Position z = -8.00 mm



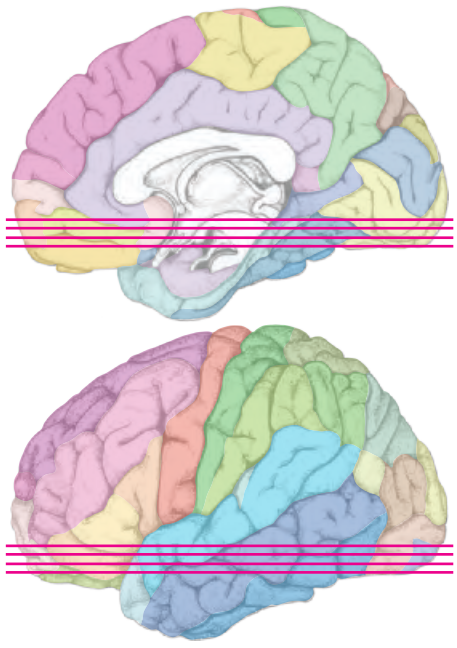


Fig.: A-25
Position z = -12.00 mm

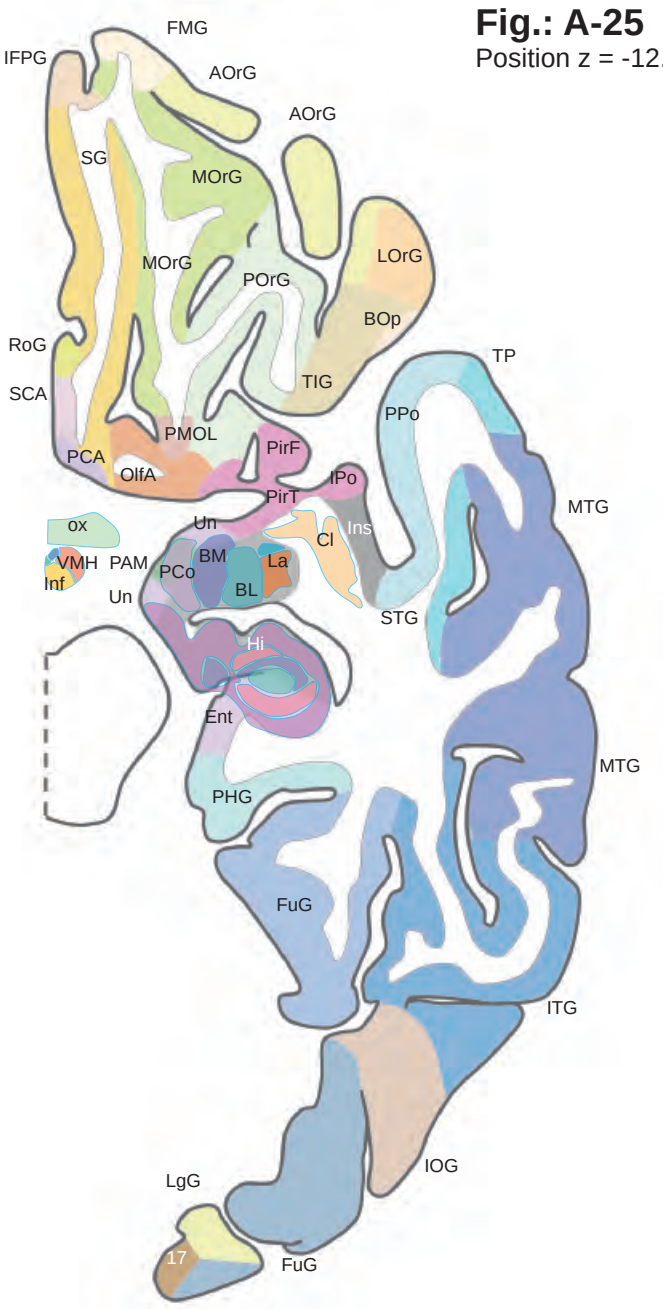
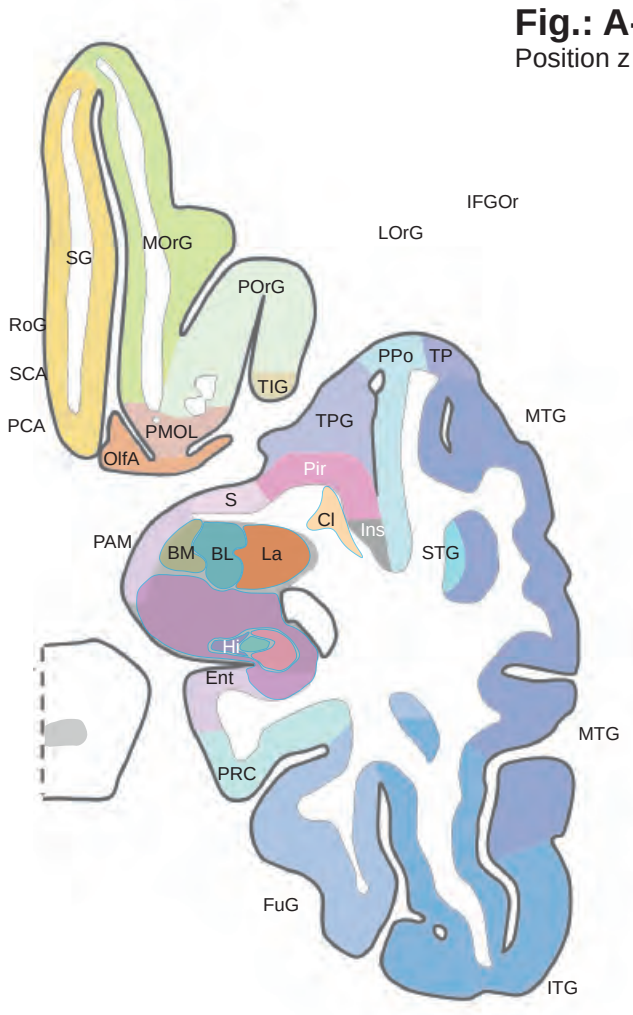


Fig.: A-26
Position z = -16.00 mm



1 cm

17 striate area
Ac accumbens nucleus
Amg amygdala
AOI area orbitoinsularis
AOrG anterior (intermediate) orbital gyrus
API area piriformis insulae
BL basolateral amygdaloid nucl.
BM basomedial amygdaloid nucl.
BOp basal operculum
CG cingulate gyrus
Cl claustrum
Ent entorhinal gyrus
FMG frontomarginal gyrus
FPu fundus region of putamen
FuG fusiform gyrus
fx fornix (column and body)
GDe gyrus descendens
Hi hippocampus
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
ILgG inferior lingual gyrus
Inf infundibular nucleus
Ins insula
IOG inferior occipital gyrus
IPo insular pole
ITG inferior temporal gyrus
La lateral amygdaloid nucleus
LgG lingual gyrus
LH lateral hypothalamic area
LOrG lateral orbital gyrus
MM medial mammillary nucleus
MOrG medial orbital gyrus
MTG middle temporal gyrus
OlfA olfactory area
opt optic tract
ox optic chiasma
Pa paraventricular hypothalamic nucleus
PAM periamygdaloid cortex
PCA precommissural archicortex
PCo post. cortical amygdaloid nucleus
PH posterior hypothalamic area
PHG parahippocampal gyrus
Pir piriform cortex
PirF piriform cortex, frontal part
PirT piriform cortex, temporal part
PMOL posteromedial orbital lobule
POrG posterior orbital gyrus
PPo planum polare
PRC perirhinal cortex
PTG paraterminal gyrus
Pu putamen
R red nucleus
RoG rostral gyrus
rsc-i retrocalcarine sulcus, inferior branch
SCA subcallosal area
SG straight gyrus
SLgG superior lingual gyrus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SO supraoptic nucleus
STG superior temporal gyrus
STh subthalamic nucleus
S subiculum
TCd tail of caudate nucleus
TIG transverse insular gyrus
TM tuberomammillary nucleus
TP temporal pole
TPG temporopolar gyrus
Un uncus
VMH ventromedial hypothalamic nucleus

Fig.: A-27
Position z = -20.00 mm

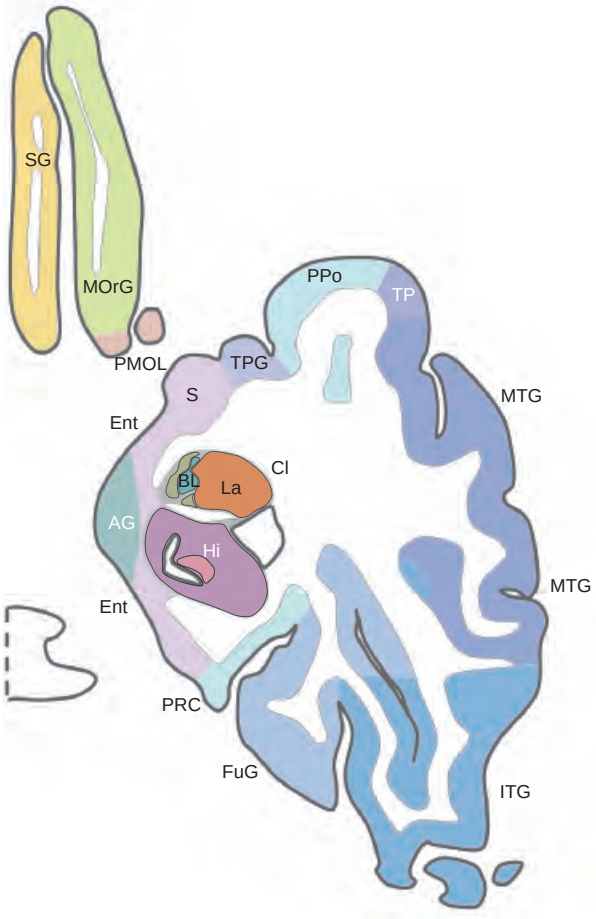
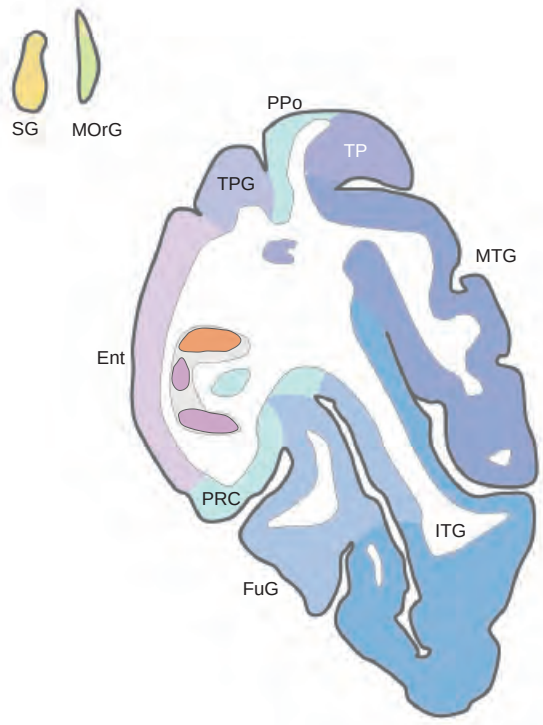
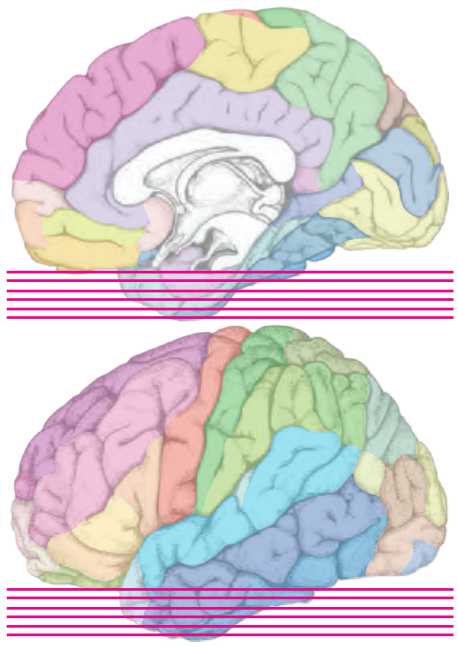


Fig.: A-28
Position z = -24.00 mm





AG ambiens gyrus
BL basolateral amygdaloid nucl.
Cl claustrum
Ent entorhinal gyrus
FuG fusiform gyrus
Hi hippocampus
ITG inferior temporal gyrus
La lateral amygdaloid nucleus
MOrG medial orbital gyrus
MTG middle temporal gyrus
PMOL posteromedial orbital lobule
PPo planum polare
PRC perirhinal cortex
SG straight gyrus
S subiculum
TP temporal pole
TPG temporopolar gyrus

Fig.: A-29
Position z = -28.00 mm

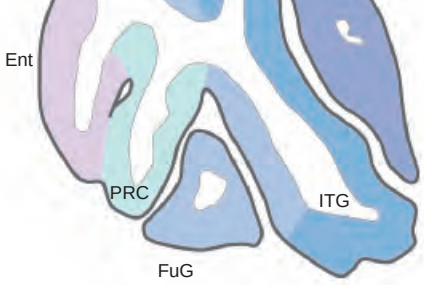


Fig.: A-30
Position z = -32.00 mm

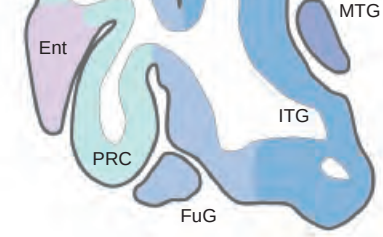


Fig.: A-31
Position z = -36.00 mm

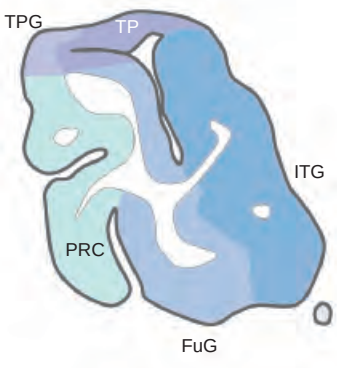
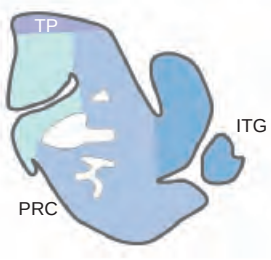


Fig.: A-32
Position z = -40.00 mm



1 cm

Fig.: S-01
Position x = 1.00 mm

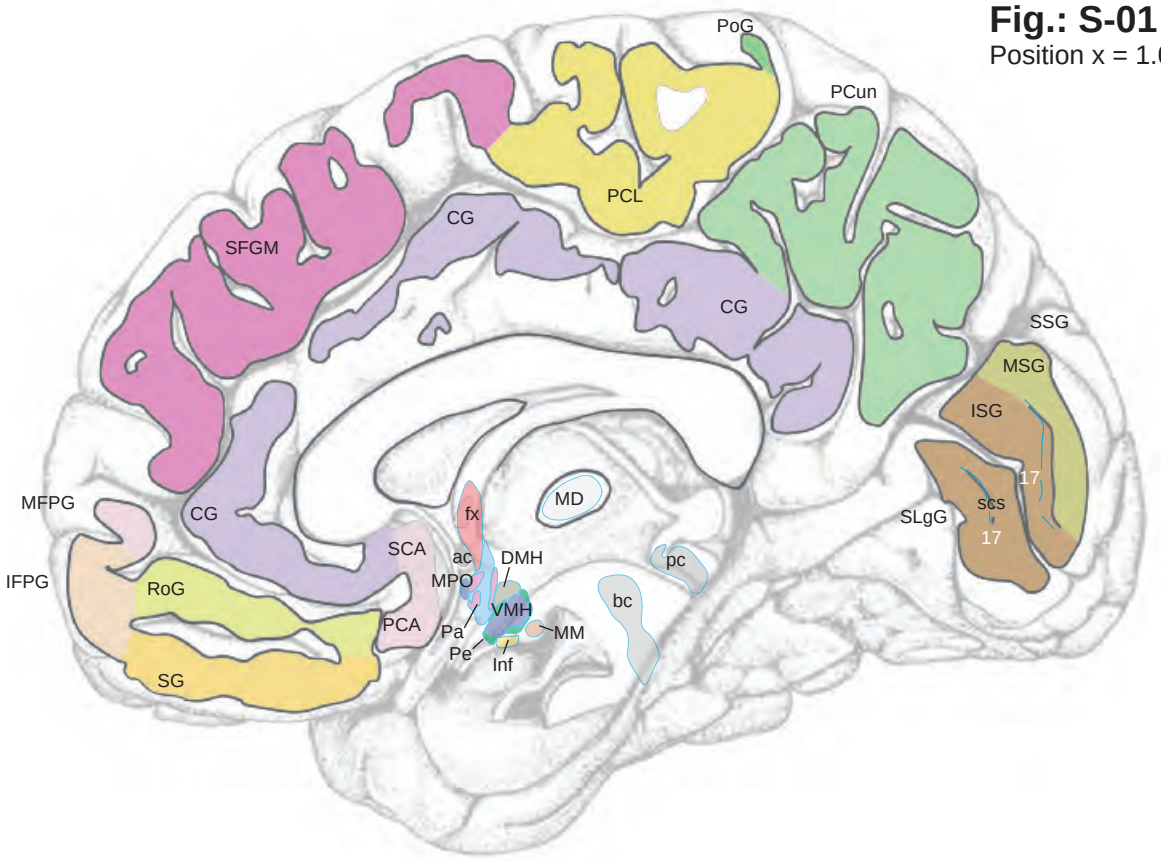
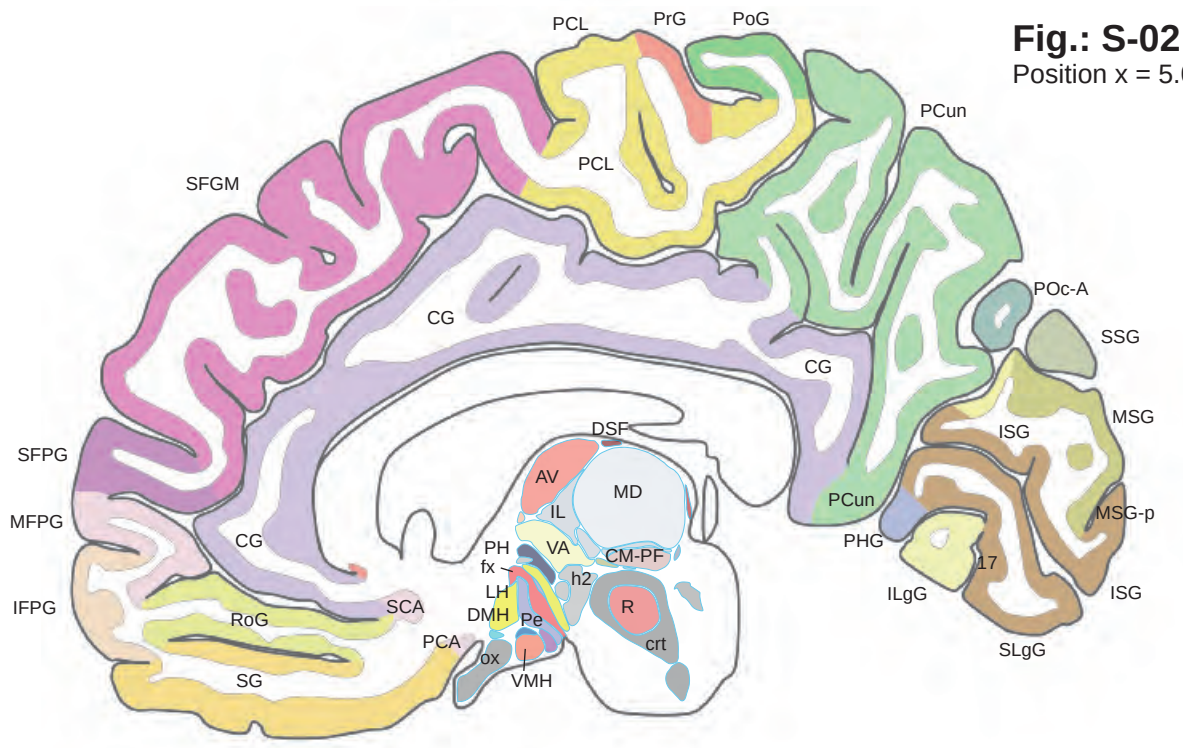
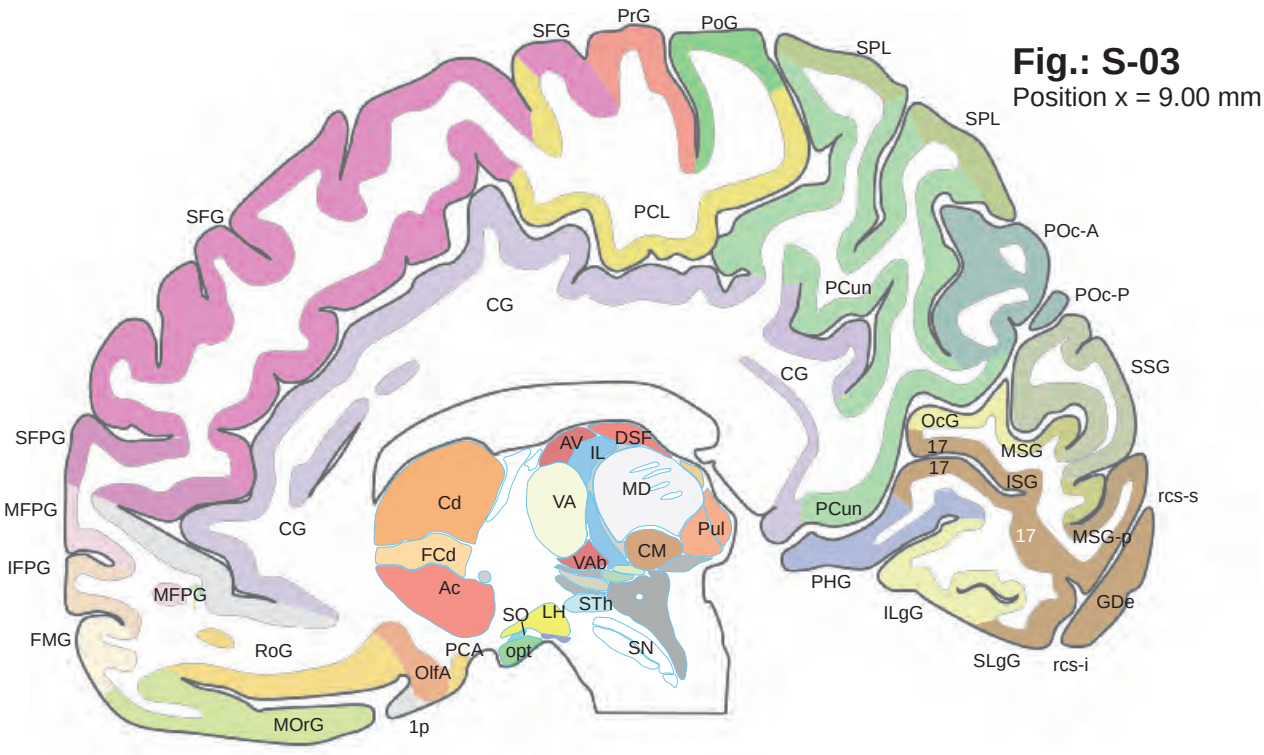


Fig.: S-02
Position x = 5.00 mm





1 cm

17 striate area
1p olfactory peduncle
Ac accumbens nucleus
ac anterior commissure
AV anteroventral thalamic nucleus
bc brachium conjuctivum
Cd caudate nucleus
CG cingulate gyrus
CM centromedian thalamic nucleus
CM-PF centromedian parafascicular nucleus
crt cerebello-rubro thalamic fibers (dentato-thalamic tract)
DMH dorsomed. hypothalamic nucleus
DSF dorsal superficial nucleus
FCd fundus region of caudate nucleus
FMG frontomarginal gyrus
fx fornix (column and body)
GDe gyrus descendens
h2 lenticular fascicle
IFPG inferior frontopolar gyrus
IL intralaminar nuclei and lamina
ILgG inferior lingual gyrus
Inf infundibular nucleus
ISG inferior sagittal gyrus
LH lateral hypothalamic area
MD medial dorsal thalamic nucleus
MFPG middle frontopolar gyrus
MM medial mammillary nucleus, med. part
MOrG medial orbital gyrus
MPO medial preoptic nucleus
MSG middle sagittal gyrus
MSG-p middle sagittal gyrus, posterior part
OcG occipital gyrus
OlfA olfactory area
opt optic tract
ox optic chiasma
Pa paraventricular hypothalamic nucleus
pc posterior commissure
PCA precommissural archicortex
PCL paracentral lobule
PCun precuneus
Pe periventricular hypothalamic nucleus
PH posterior hypothalamic area
PHG parahippocampal gyrus
POc-A parieto-occipital arc, anterior part
POc-P parieto-occipital arc, posterior part
PoG postcentral gyrus
PrG precentral gyrus
Pul pulvinar
R red nucleus
rcs-i retrocalcarine sulcus, inferior branch
rcs-s retrocalcarine sulcus, superior branch
RoG rostral gyrus
SCA subcallosal area
scs subcalcarine sulcus
SFG superior frontal gyrus
SFGM superior frontal gyrus, medial division
SFPG superior frontopolar gyrus
SG straight gyrus
SLgG superior lingual gyrus
SN substantia nigra
SO supraoptic nucleus
SPL superior parietal lobule
SSG superior sagittal gyrus
STh subthalamic nucleus
VA ventroanterior thalamic nucleus
VAb basal ventroanterior thalamic nucleus
VMH ventromedial hypothalamic nucleus

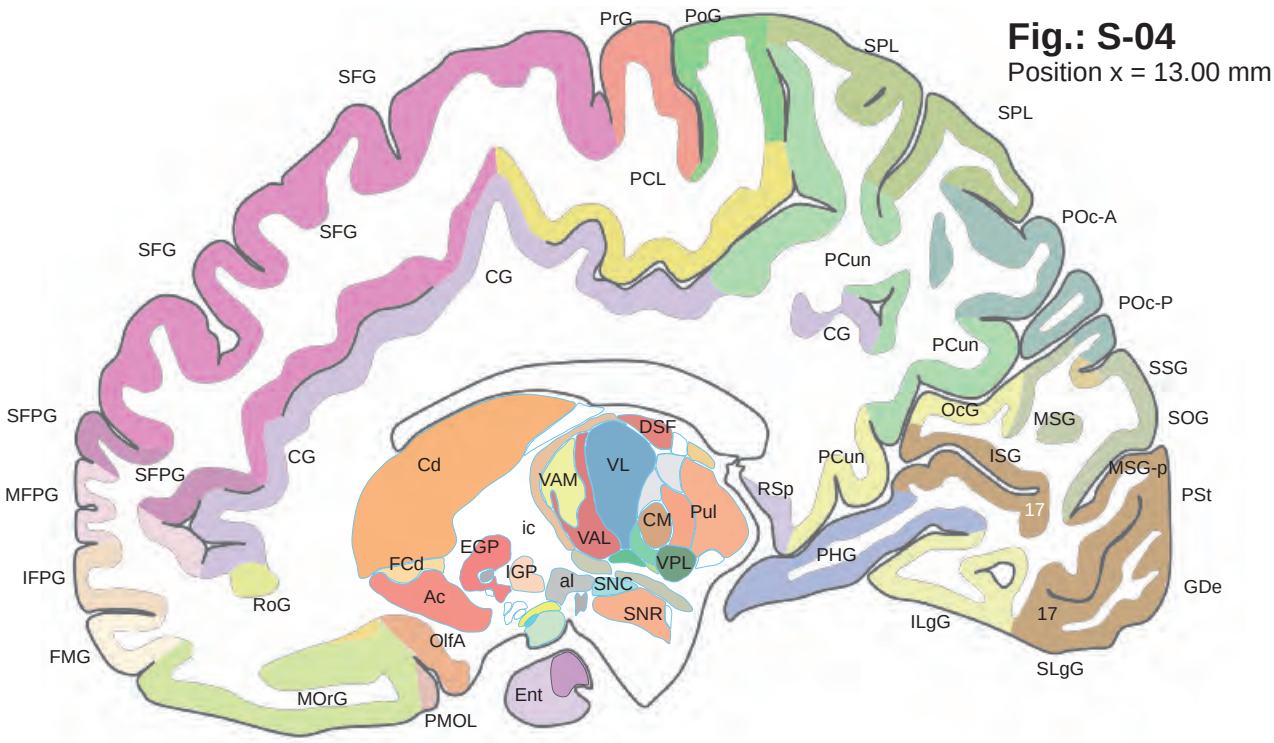
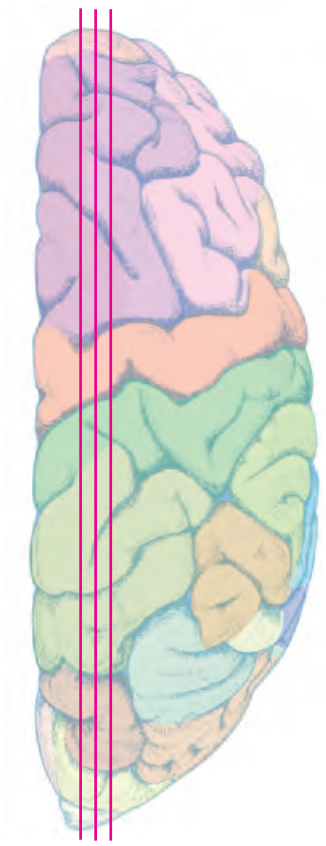


Fig.: S-04
Position x = 13.00 mm



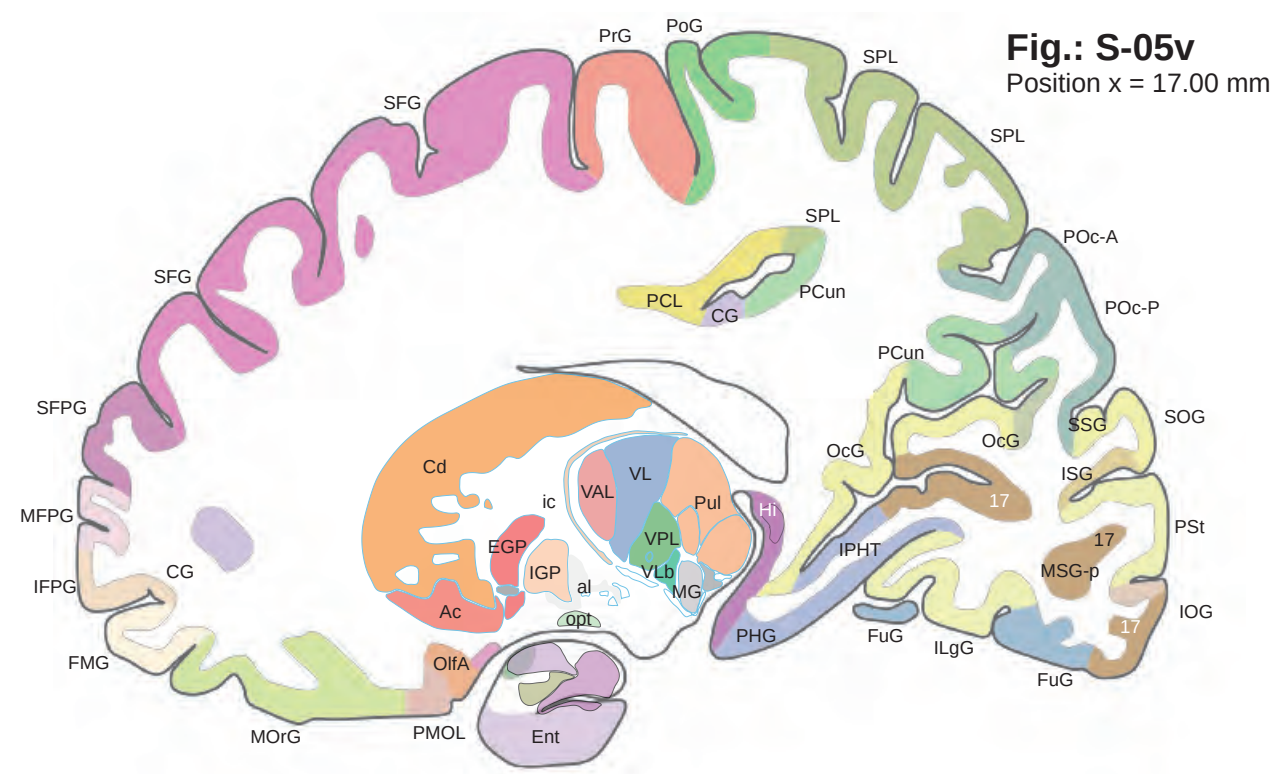


Fig.: S-05v
Position x = 17.00 mm

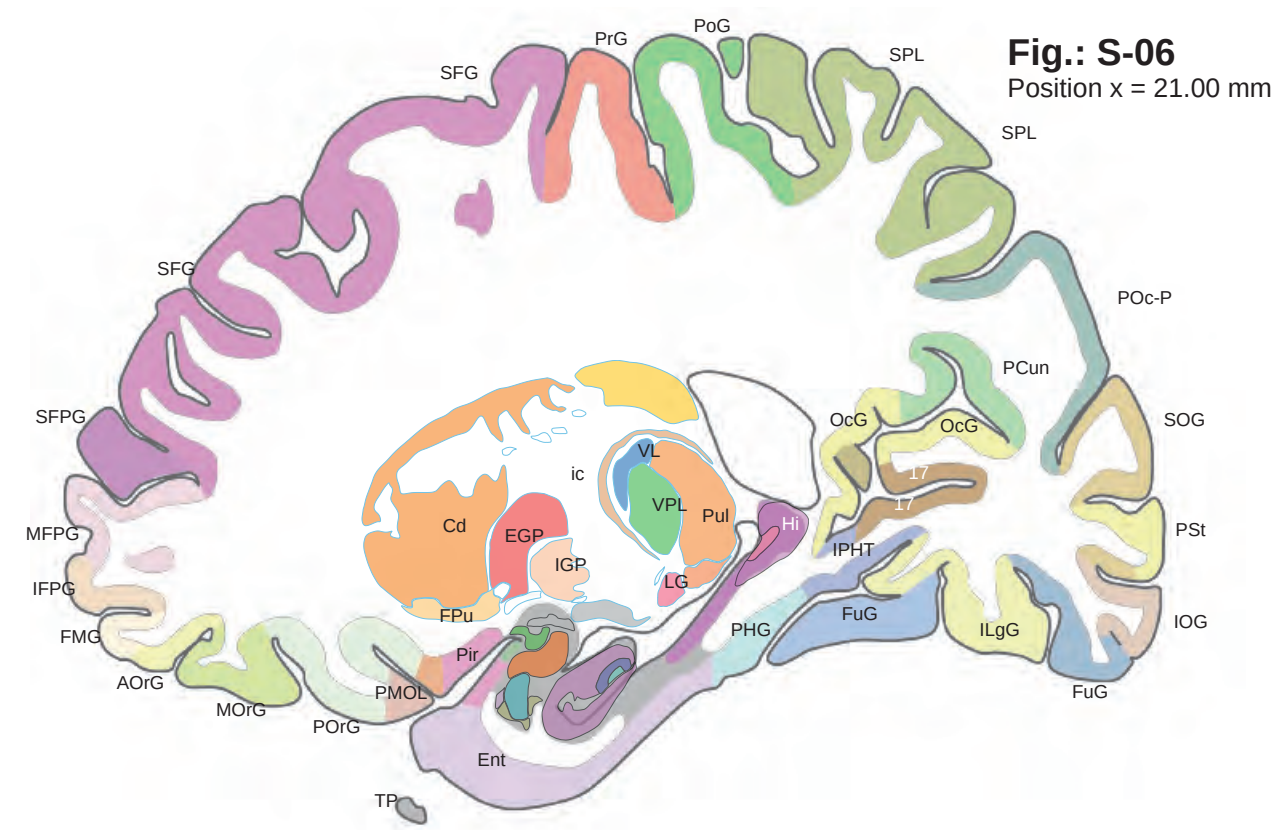
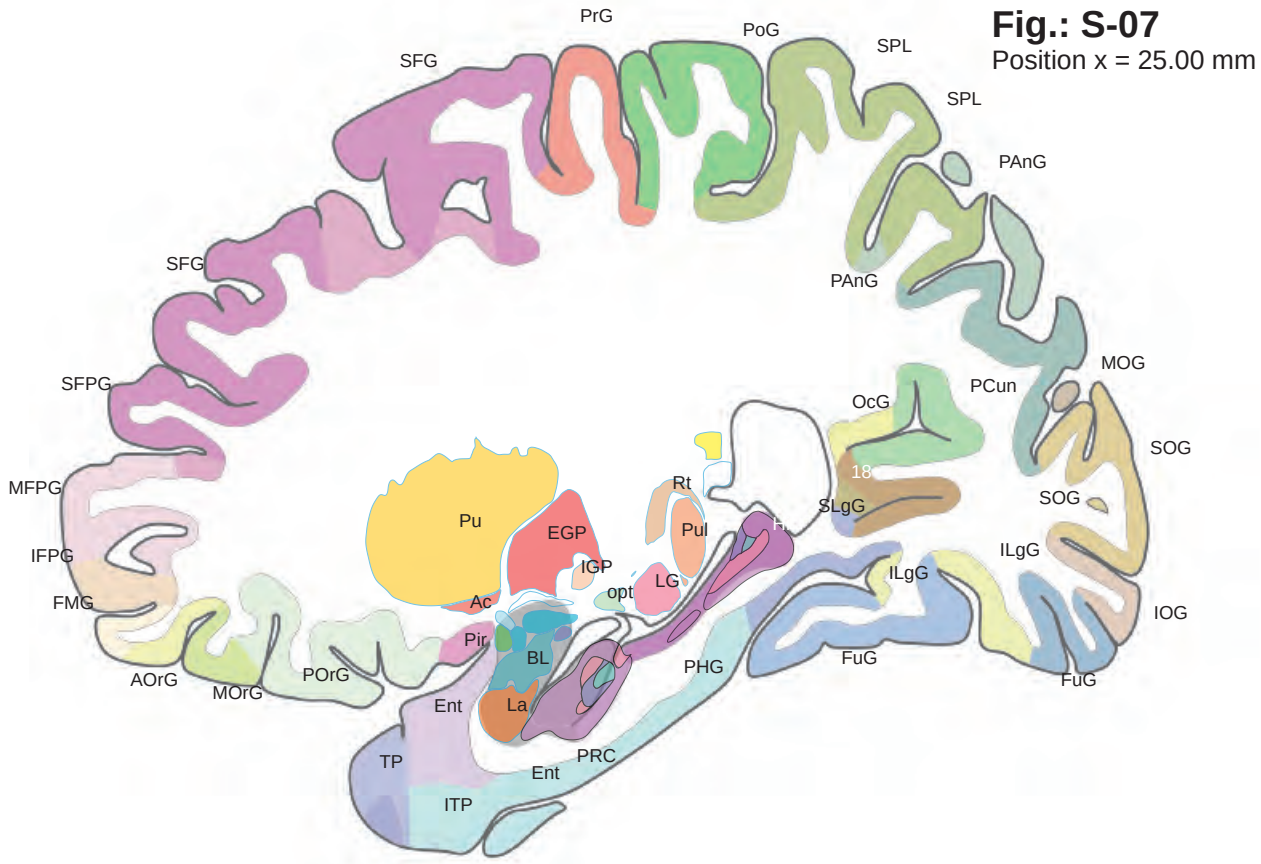


Fig.: S-06
Position x = 21.00 mm

1 cm

17 striate area
ac anterior commissure
Ac accumbens nucleus
al ansa lenticularis
AOrG anterior (intermediate) orbital gyrus
Cd caudate nucleus
CG cingulate gyrus
CM centromedian thalamic nucleus
DSF dorsal superficial nucleus
EGP external globus pallidus
Ent entorhinal gyrus
FCd fundus region of caudate nucleus
FMG frontomarginal gyrus
FuG fusiform gyrus
GDe gyrus descendens
Hi hippocampus
ic internal capsule
IFPG inferior frontopolar gyrus
IGP internal globus pallidus
ILgG inferior lingual gyrus
IOG inferior occipital gyrus
IPHT isthmo-parahippocampal transition
ISG inferior sagittal gyrus
LG lateral geniculate nucleus
MFPG middle frontopolar gyrus
MG medial geniculate nucleus
MOrG medial orbital gyrus
MSG middle sagittal gyrus
MSG-p middle sagittal gyrus, posterior part
OcG occipital gyrus
OlfA olfactory area
opt optic tract
PCL paracentral lobule
PCun precuneus
PHG parahippocampal gyrus
Pir piriform cortex
PMOL posteromedial orbital lobule
POc-A parieto-occipital arc, anterior part
POc-P parieto-occipital arc, posterior part
PoG postcentral gyrus
POrG posterior orbital gyrus
PrG precentral gyrus
PSt parastriate area
Pul pulvinar
RoG rostral gyrus
RSp retrosplenial cortex
SFG superior frontal gyrus
SFPG superior frontopolar gyrus
SLgG superior lingual gyrus
SNC substantia nigra, pars compacta
SNR substantia nigra, pars reticulata
SOG superior occipital gyrus
SPL superior parietal lobule
SSG superior sagittal gyrus
TP temporal pole
VAL lateral ventroanterior nucleus
VAM medial ventroanterior nucleus
VL ventrolateral thalamic nucleus
VLb basal ventrolateral thalamic nucleus
VPL lateral ventroposterior thalamic nucleus

Fig.: S-07
Position x = 25.00 mm



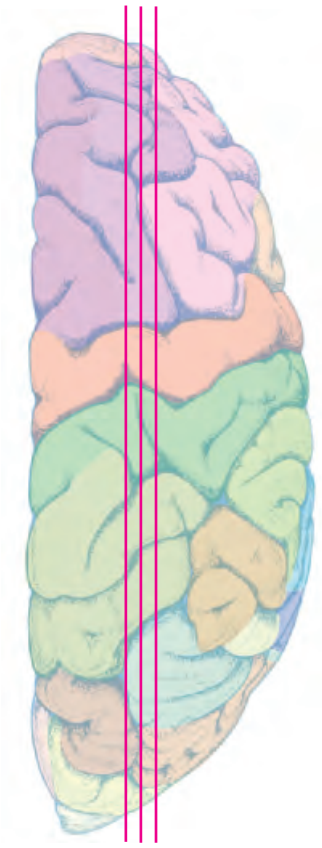


Fig.: S-08
Position x = 29.00 mm

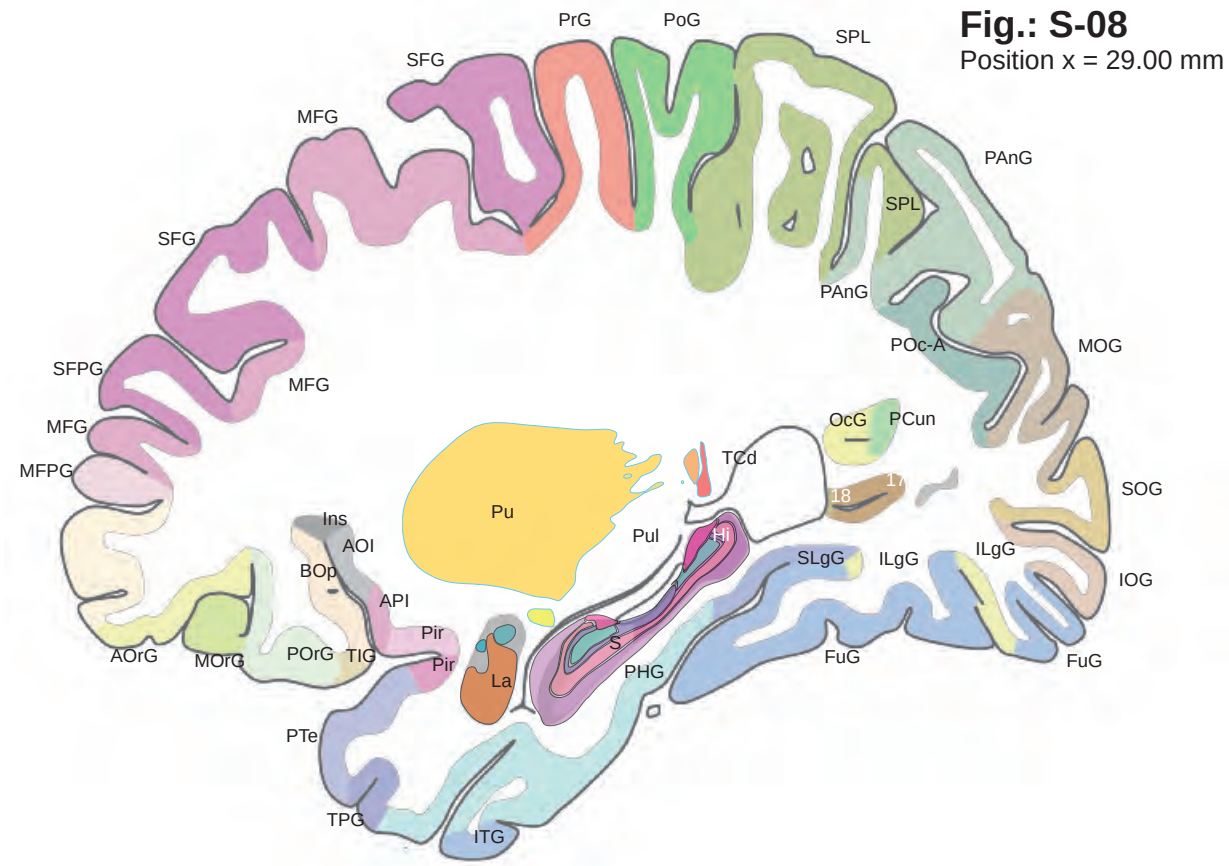
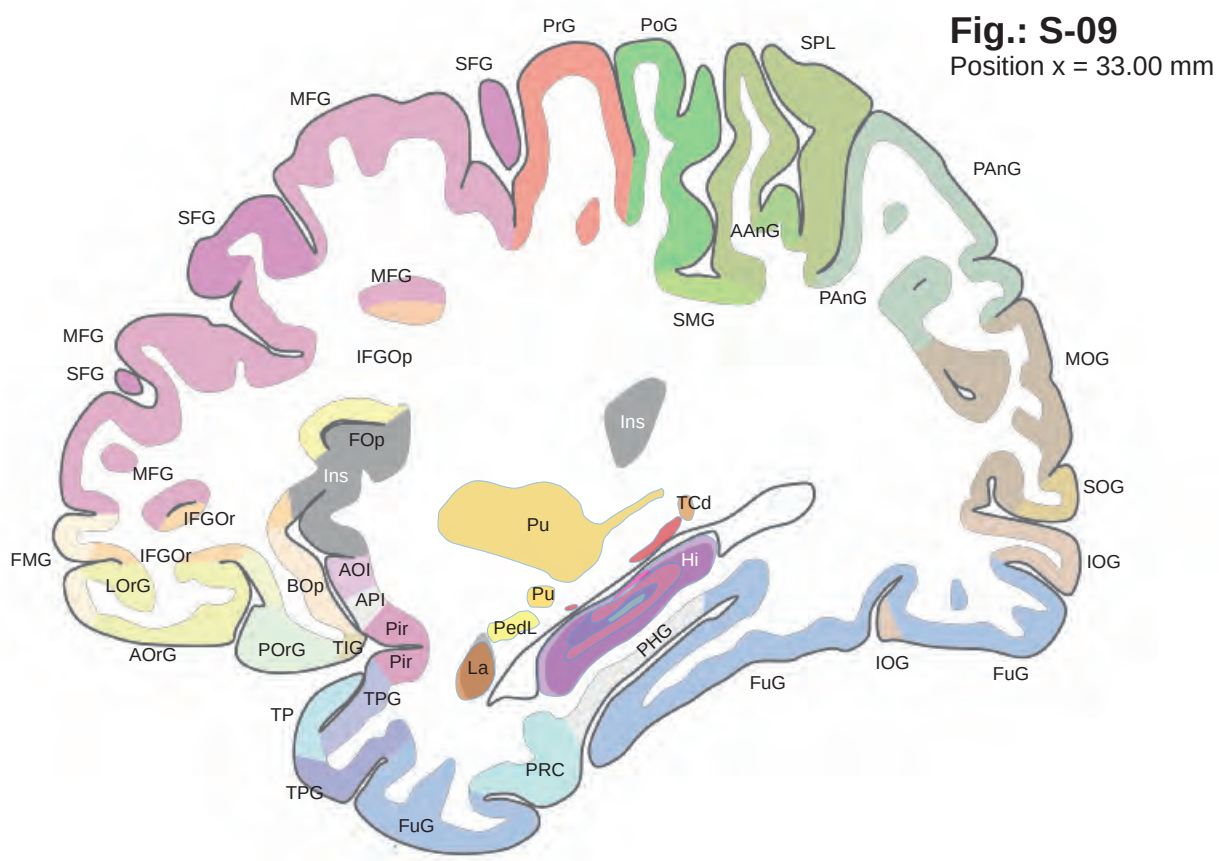


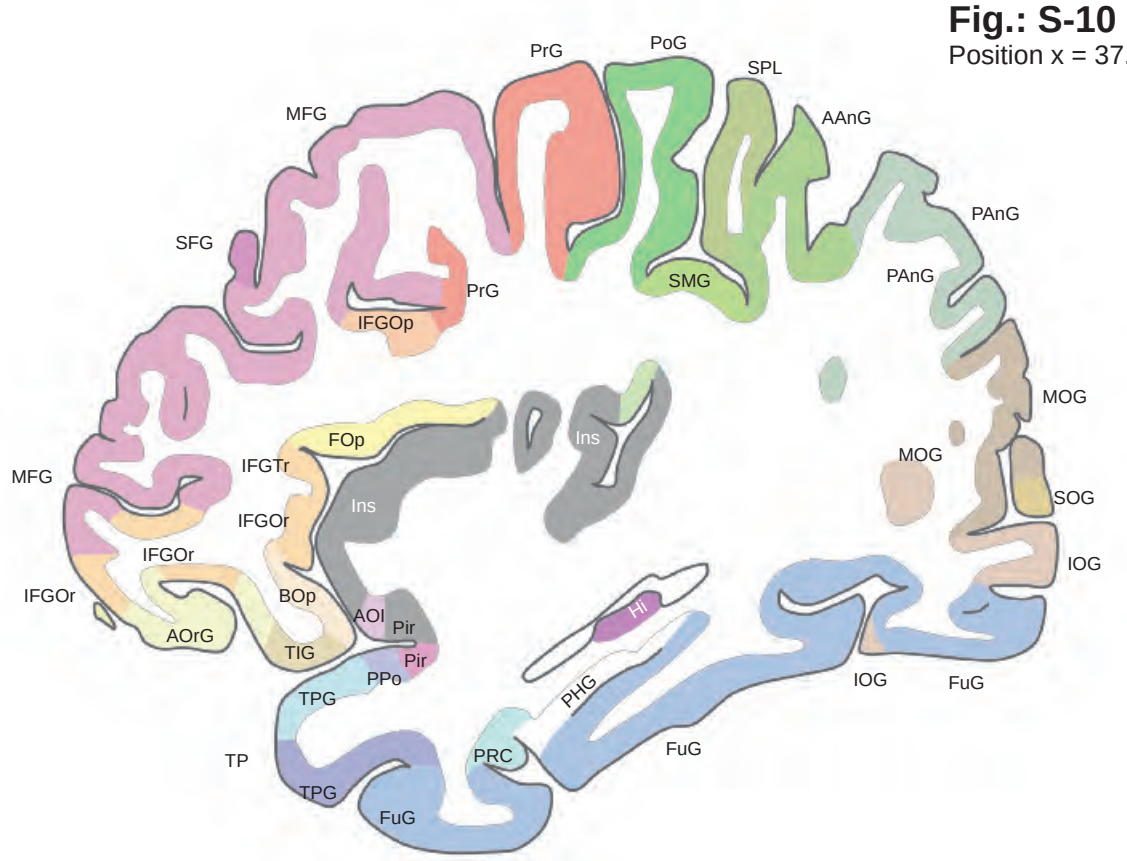
Fig.: S-09
Position x = 33.00 mm



17 striate area
18 area 18
AAnG angular gyrus, anterior division
Ac accumbens nucleus
ac anterior commissure
AOI area orbitoinsularis
AOrG anterior (intermediate) orbital gyrus
API area piriformis insulae
BL basolateral amygdaloid nucleus
BOp basal operculum
EGP external globus pallidus
Ent entorhinal gyrus
FMG frontomarginal gyrus
FOp frontal operculum
FuG fusiform gyrus
Hi hippocampus
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFPG inferior frontopolar gyrus
IGP internal globus pallidus
ILgG inferior lingual gyrus
Ins insula
IOG inferior occipital gyrus
ITG inferior temporal gyrus
ITP inferior temporopolar region
La lateral amygdaloid nucleus
LG lateral geniculate nucleus
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MFPG middle frontopolar gyrus
MOG middle occipital gyrus
MOrG medial orbital gyrus
OcG occipital gyrus
opt optic tract
PAnG posterior angular gyrus
PCun precuneus
PedI peduncle of lentiform nucleus
PHG parahippocampal gyrus
Pir piriform cortex
POc-A parieto-occipital arc, anterior part
PoG postcentral gyrus
POrG posterior orbital gyrus
PRC perirhinal cortex
PrG precentral gyrus
PTe planum temporale
Pu putamen
Pul pulvinar
Rt reticular thalamic nucleus
SFG superior frontal gyrus
SFPG superior frontopolar gyrus
SLgG superior lingual gyrus
SMG supramarginal gyrus
SOG superior occipital gyrus
SPL superior parietal lobule
S subiculum
TCd tail of caudate nucleus
TIG transverse insular gyrus
TP temporal pole
TPG temporopolar gyrus

1 cm

Fig.: S-10
Position x = 37.00 mm



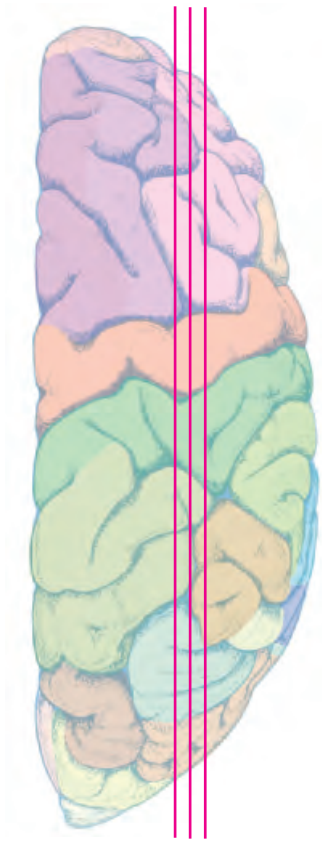


Fig.: S-11
Position x = 41.00 mm

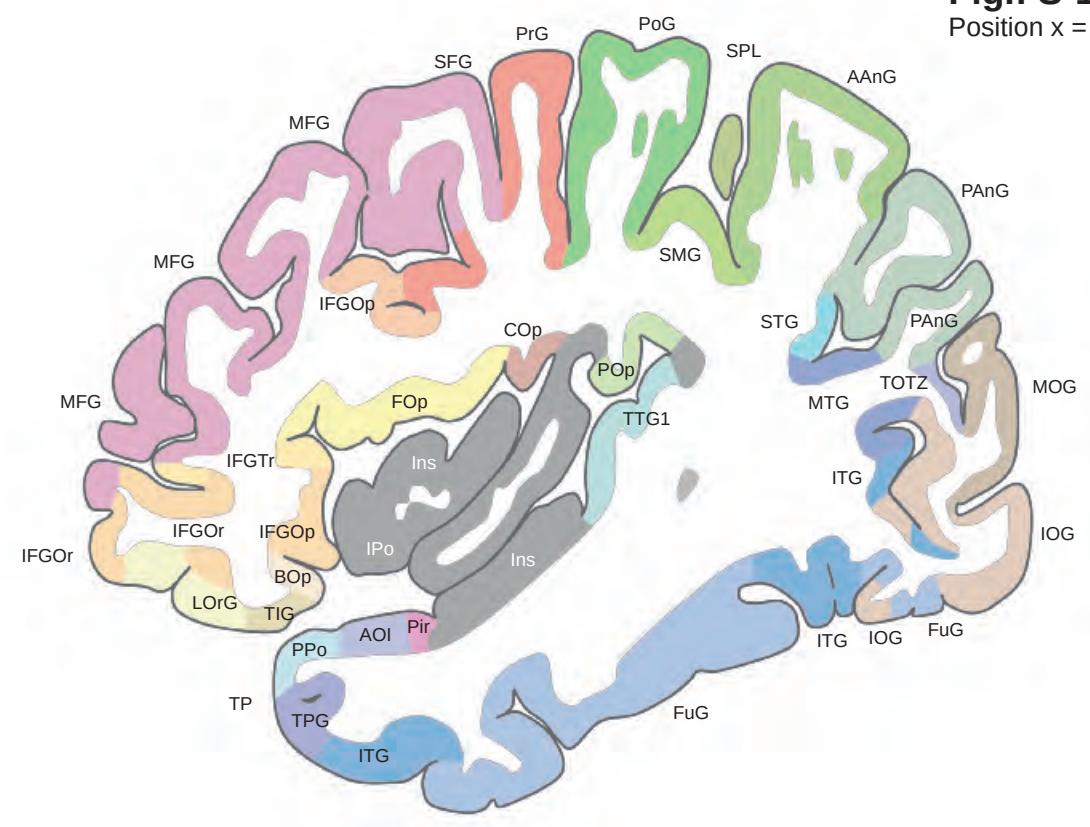
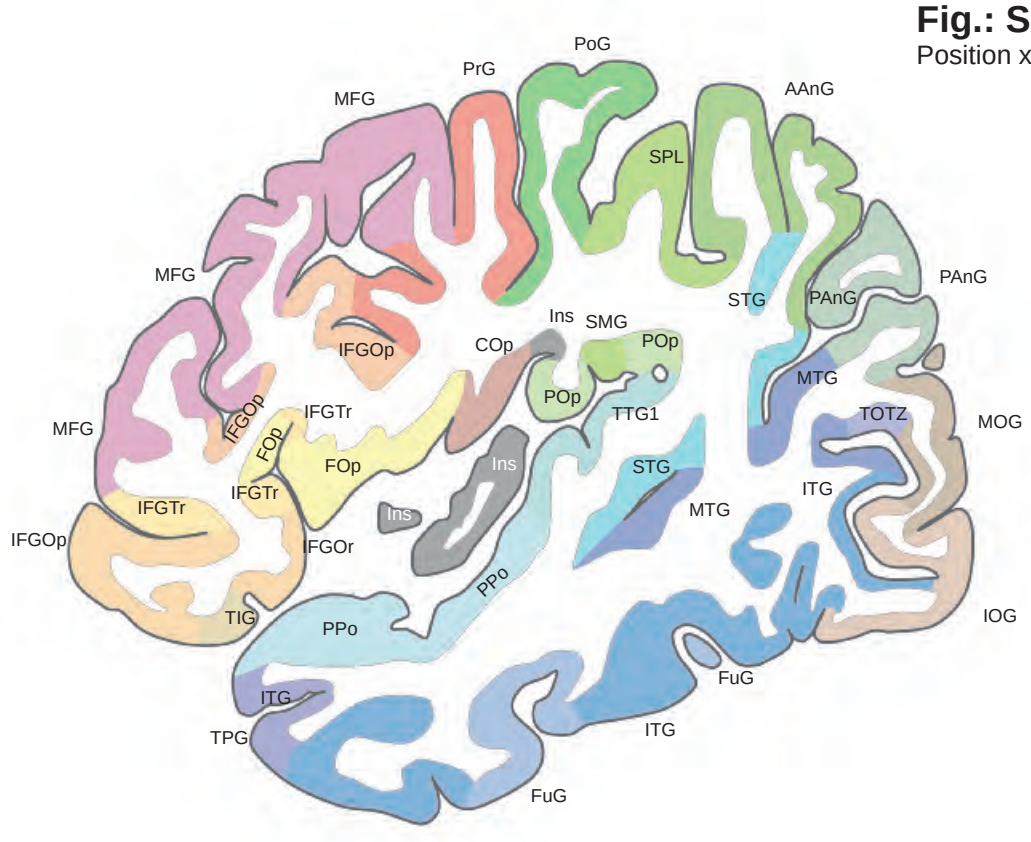


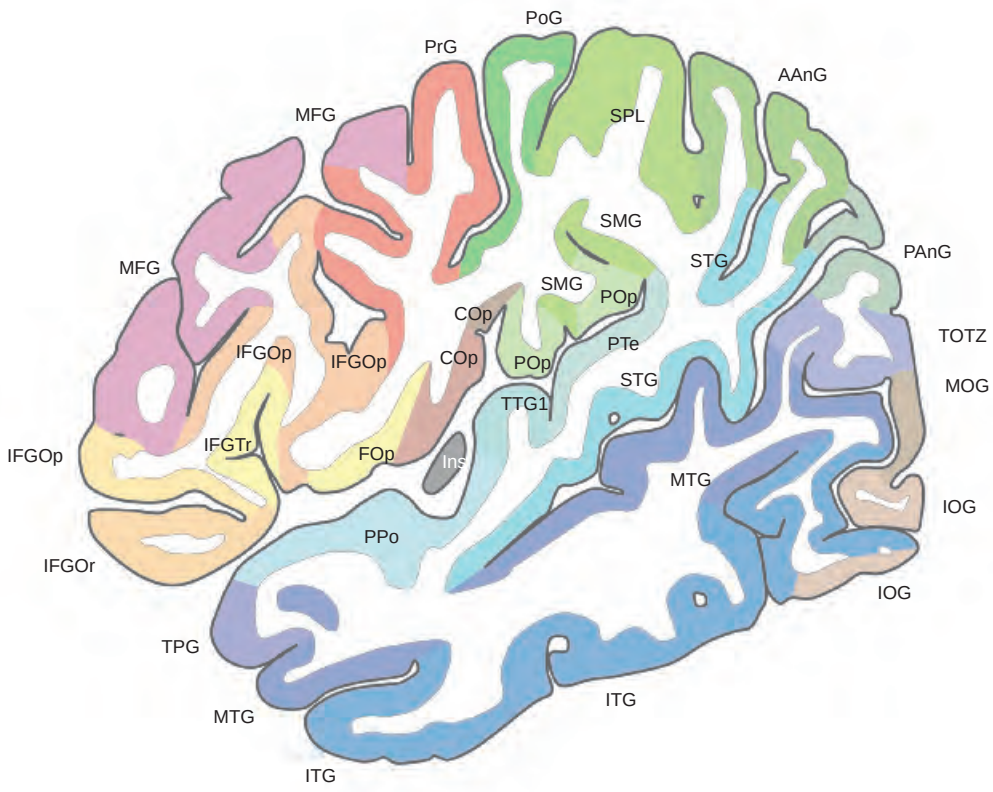
Fig.: S-12
Position x = 45.00 mm



1 cm

AAnG angular gyrus, anterior division
AOI area orbitoinsularis
AOrG anterior (intermediate) orbital gyrus
BOp basal operculum
COp central operculum (Rolandi)
FOp frontal operculum
FuG fusiform gyrus
Hi hippocampus
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
Ins insula
IOG inferior occipital gyrus
IPo insular pole
ITG inferior temporal gyrus
LOrG lateral orbital gyrus
MFG middle frontal gyrus
MOG middle occipital gyrus
MTG mammillo-tegmental tract
PAnG posterior angular gyrus
PHG parahippocampal gyrus
Pir piriform cortex
PoG postcentral gyrus
POp parietal operculum
PPo planum polare
PRC perirhinal cortex
PrG precentral gyrus
SFG superior frontal gyrus
SMG supramarginal gyrus
SOG superior occipital gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TIG transverse insular gyrus
TOTZ temporooccipital transition zone
TP temporal pole
TPG temporopolar gyrus
TTG1 ant. transverse temporal gyrus

Fig.: S-13
Position x = 49.00 mm



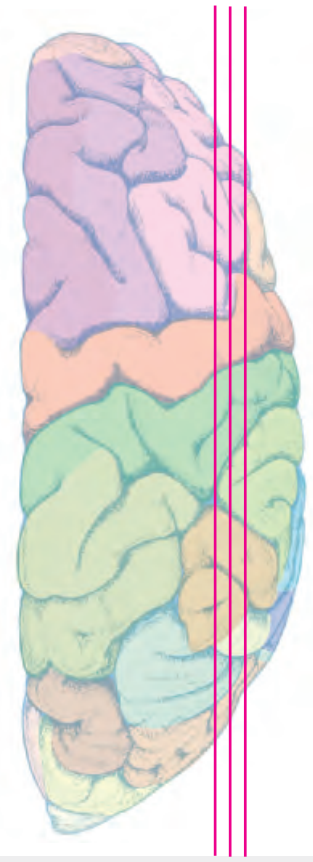


Fig.: S-14
Position x = 53.00 mm

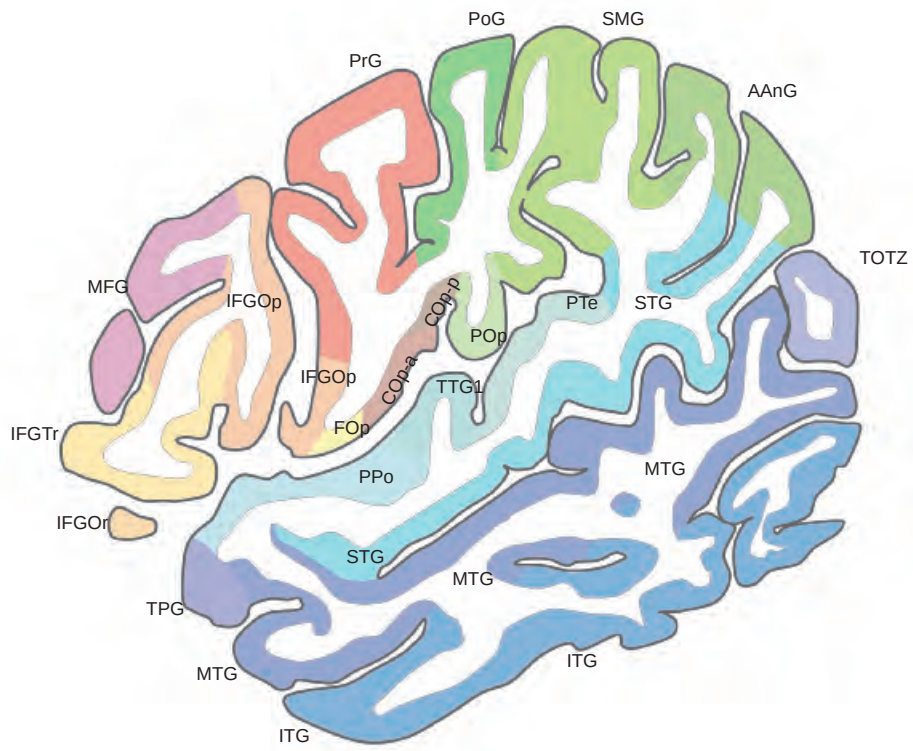
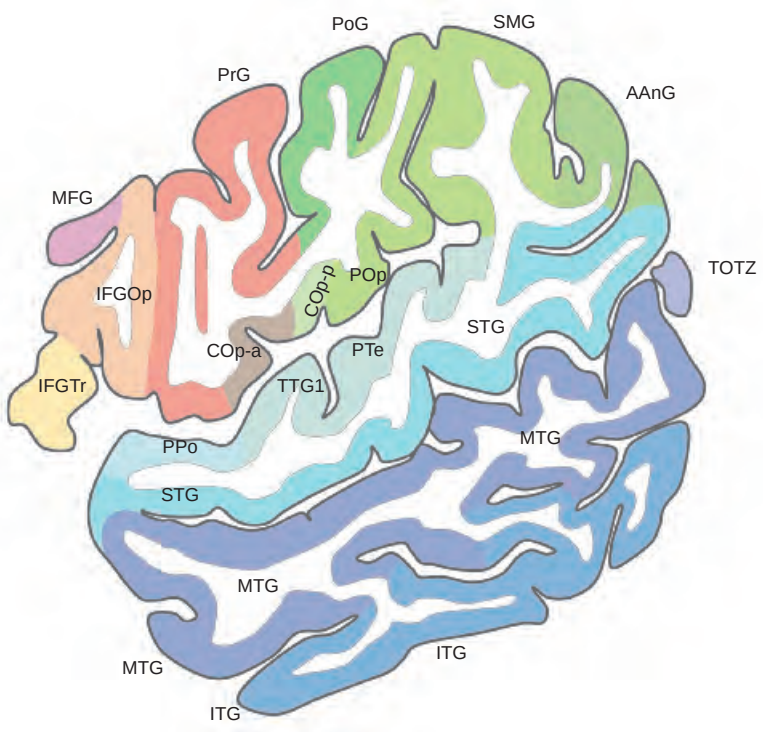


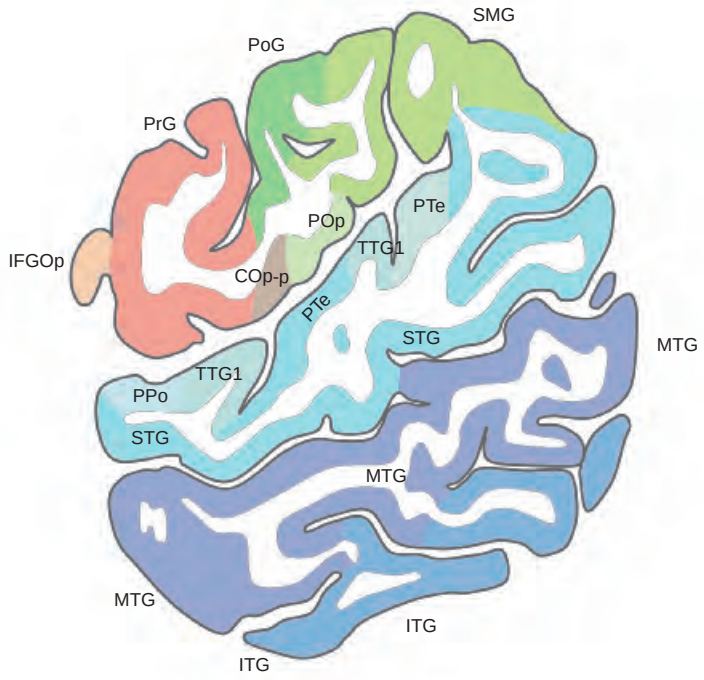
Fig.: S-15
Position x = 57.00 mm



AAnG angular gyrus, anterior division
COp central operculum (Rolandi)
COp-a anterior central operculum
COp-p posterior central operculum
FOp frontal operculum
IFGOp inferior frontal gyrus, opercular part
IFGOr inferior frontal gyrus, orbital part
IFGTr inferior frontal gyrus, triangular part
Ins insula
IOG inferior occipital gyrus
ITG inferior temporal gyrus
MFG middle frontal gyrus
MOG middle occipital gyrus
MTG middle temporal gyrus
PAnG posterior angular gyrus
PoG postcentral gyrus
POp parietal operculum
PPo planum polare
PrG precentral gyrus
PTe planum temporale
SMG supramarginal gyrus
SPL superior parietal lobule
STG superior temporal gyrus
TOTZ temporooccipital transition zone
TPG temporopolar gyrus
TTG1 ant. transverse temporal gyrus

1 cm

Fig.: S-16
Position x = 61.00 mm



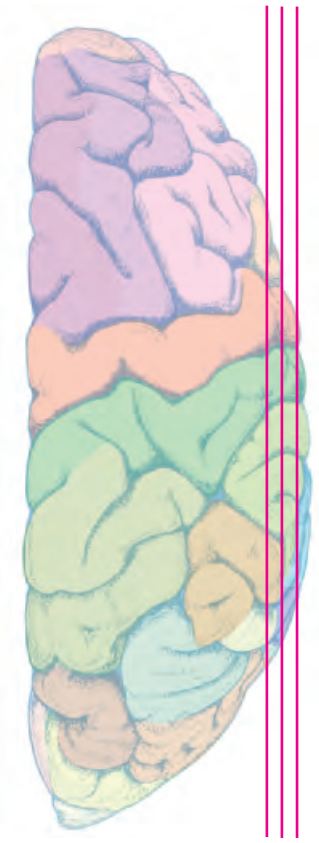


Fig.: S-17
Position x = 65.00 mm

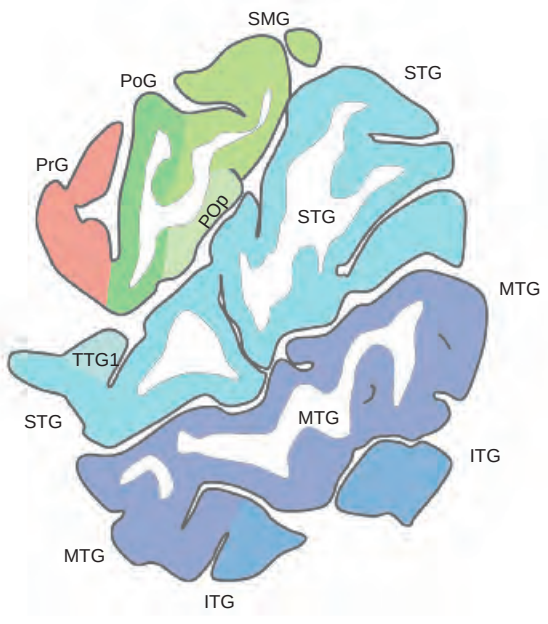
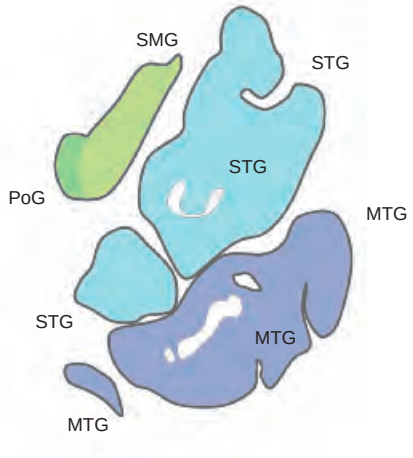


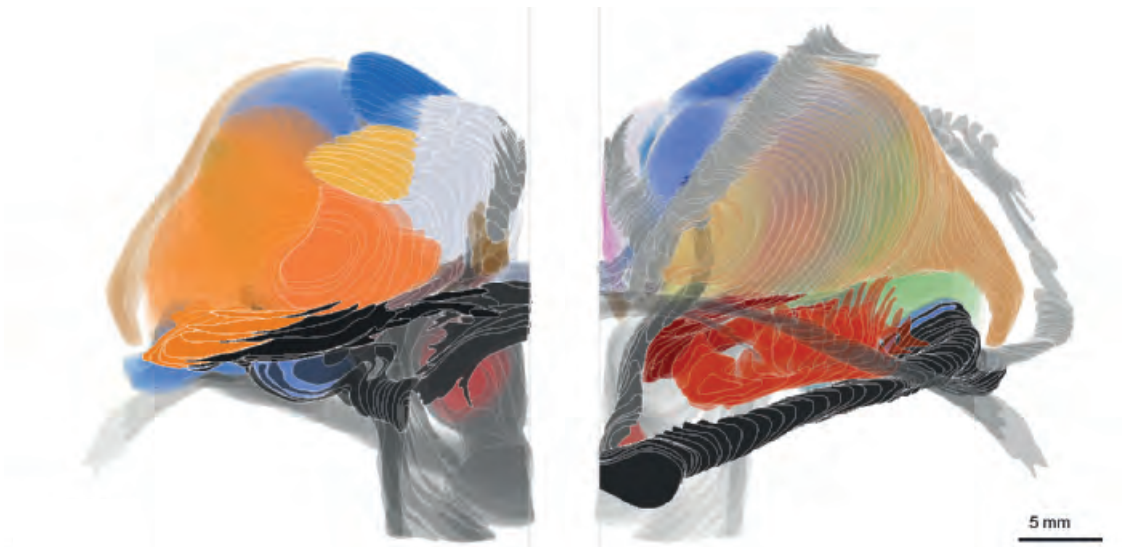
Fig.: S-18
Position x = 69.00 mm



COp-p posterior central operculum
IFGOp inferior frontal gyrus, opercular part
ITG inferior temporal gyrus
MTG middle temporal gyrus
PoG postcentral gyrus
POp parietal operculum
PPo planum polare
PrG precentral gyrus
PTe planum temporale
SMG supramarginal gyrus
STG superior temporal gyrus
TTG1 ant. transverse temporal gyrus

1 cm

2.5 Maps of Subcortical Areas

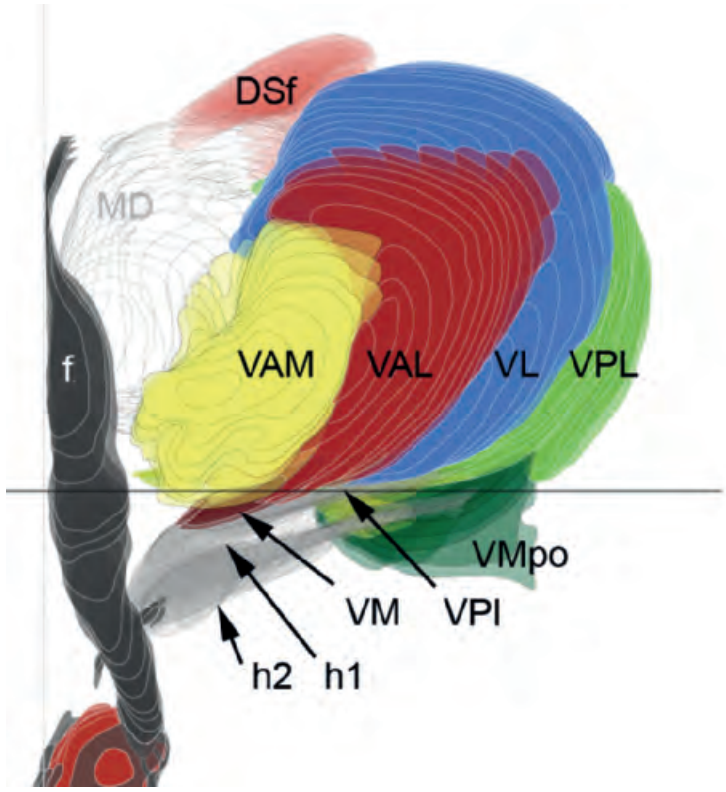


This part presents maps of the thalamus and of the hypothalamus of the right hemisphere of the *Atlas* brain. The images are shown at higher magnification than in the main *Atlas*. The delineations were curated by F. Forutan and Y. Koutcherov. The nomenclature is arranged systematically to facilitate orientation. Importantly, these images were not transformed to fit the stereotaxic (Talairach or MNI) space. They are identical to the actual mounted sections and to the photographs that can evaluated by “virtual microscopy” in the internet (www.thehumanbrain.info).

References:

Koutcherov, Y., Mai, J.K., Ashwell, K.W.S., Paxinos, G.: The organization of the human paraventricular hypothalamic nucleus. J. Comp. Neurol. 423: 299-318 (2000).
Koutcherov, Y., Mai, J.K., Paxinos, G.: Hypothalamus of the human fetus. J. Chemical Neuroanatomy, 26; 253-270 (2003).
Koutcherov, Y., Mai, J.K., Paxinos, G.: Hypothalamus of the human fetus. In: The Human Nervous System. Academic Press, San Diego, USA (2004).
Koutcherov, Y., Mai, J.K., Paxinos, G.: Organisation of the human dorsomedial hypothalamic nucleus. NeuroReport: 15 (1), 107-111 (2004)
Koutcherov, Y. Paxinos, G. Mai, J.: The organization of the human medial preoptic nucleus. J. Comp. Neurol. 503:392–406 (2007).
Mai, J.K. and Forutan, F.: Thalamus. In: The Human Nervous System. Academic Press, San Diego, USA 620-679 (2012).

2.5.1 Thalamus by F. Forutan



Superior Region (anterior group nuclei)

AV	anteroventral nucleus (anteroprincipal nucleus)
AM	anteromedial nucleus
AD	anterodorsal nucleus
DSf	dorsal superficial nucleus

Medial Region

MD	**mediodorsal nucleus**
MDMC	magnocellular mediodorsal nucleus, (medial MD; Ncl. medialis fibrosus)
MDPC	parvicellular mediodorsal nucleus, (central MD; Ncl. medialis fasciculosus)
MDPL	paralaminar (paralamellar) mediodorsal nucleus, (lateral MD; Ncl. densocellularis / multiformis)

Lateral Region

Motor Thalamus

VA	**ventroanterior nucleus** (ventral anterior nucleus)
VAM	medial ventroanterior nucleus (nigral afferents)
VAMC	magnocellular ventroanterior nucleus
VAL	lateral ventroanterior nucleus (pallidal afferents)
VAb	basal ventroanterior nucleus [VM] (entry zone of nigral and amygdaloid afferents)
VL	**ventrolateral nucleus**
VLA	anterior ventrolateral nucleus (medial oral division)
VLP	posterior ventrolateral nucleus (lateral caudal division)
VLPI	posterior ventrolateral nucleus, internal part
VLPE	posterior ventrolateral nucleus, external part
VLb	basal (inferior) ventrolateral nucleus [VPI] (entry zone of the cerebellar fibers)

Sensory Thalamus

VP	**ventroposterior nucleus** or complex
VPL	lateral ventroposterior nucleus;
VPM	medial ventroposterior nucleus
VPS	superior ventroposterior nucleus (Kaas)
VPPC	ventroposterior nucleus, parvicellular part
VPMPC	medial ventroposterior nucleus, parvicellular part
VPb	basal ventroposterior nucleus [VMpo] (entry zone of sensory afferents)

Intralaminar Formation

ILA anterior group of the intralaminar nuclei

CeMe	central medial nucleus
CL	central lateral nucleus
PC	paracentral nucleus
Cuc	cucullar nucleus

ILC central group of intralaminar nuclei

CM	centromedian nucleus
PF	parafascicular nucleus
SPf	subparafascicular nucleus
ILP	posterior intralaminar group
Lim	limitans nucleus
SGe	supragenicular nucleus

Periventricular Formation (midline nuclei)

dorsal component of the periventricular formation

PT	paratenial nucleus
PV	paraventricular nucleus

ventral component of the periventricular formation

Re	reuniens nucleus
SM	submedius nucleus
PeV	periventricular nucleus

Posterior Region

Pul pulvinar nucleus (pulvinar-LP complex)

Pul	pulvinar nucleus (pulvinar-LP complex)
APul	anterior (oral) pulvinar nucleus
ADPul	anterodorsal pulvinar nucleus (lateral posterior nucleus)
IPul	inferior pulvinar nucleus
IDPul	inferior pulvinar nucleus, dorsal part
ILPul	inferior pulvinar nucleus, intermediate part
IVPul	inferior pulvinar nucleus, ventral part
IGPul	intergeniculate pulvinar nucleus
LPul	lateral pulvinar nucleus
MPul	medial pulvinar nucleus
MLPul	mediolateral pulvinar nucleus
SFPul	superficial pulvinar nucleus
SPul	superior pulvinar nucleus

Prethalamus

PRt	prereticulate nucleus
Rt	reticulate nucleus
Fa	fasciculosus nucleus

Epithalamus

HB	habenular nucleus
HBL	lateral habenular nucleus
HBM	medial habenular nucleus

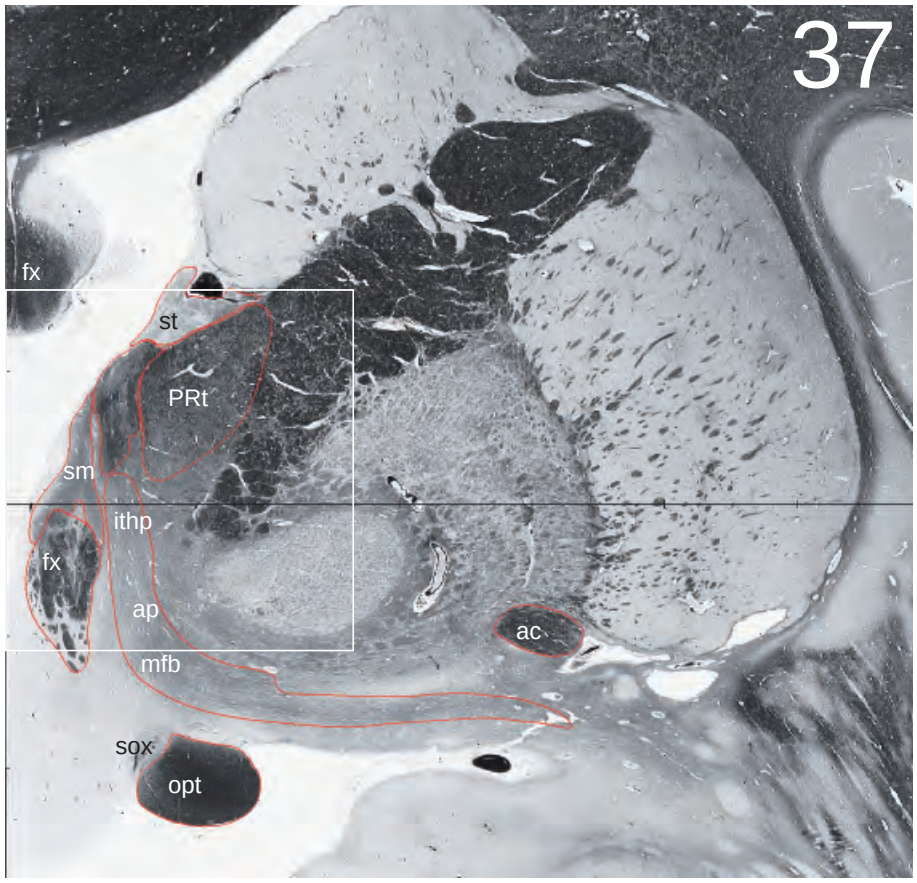
Metathalamus

LG	lateral geniculate nucleus
MG	medial geniculate nucleus

Fibers

ac	anterior commissure	lenf	lenticular fasciculus
al	ansa lenticularis	ll	lateral lemniscus
ap	ansa peduncularis	mfb	medial forebrain bundle
ar	acoustic radiation	ml	medial lemniscus
bic	brachium of the inf. colliculus	mp	mammillary peduncle
cmg	capsule of MGN	mt	mammillothalamic tract
cr	capsule of nucleus ruber	opt	optic tract
csc	commissure of sup. colliculus	or	optic radiation
eml	external medullary lamina	palhy	pallidohypothalamic tract
FF	Field of Forel	pc	posterior commissure
fr	fasciculus retroflexus	prf	principal mammillary fasciculus
fx	fornix	slf	sublenticular fascicle
h1	thalamic fascicle	sm	stria medullaris
h2	lenticular fascicle	sox	supraoptic commissure
hbc	habenular commissure	st	stria terminalis
iml	internal medullary lamina	sumx	supramammillary commissure
ithp	inferior thalamic peduncle	vaf	ventral amygdaloid fibers

Other abbreviations: see Index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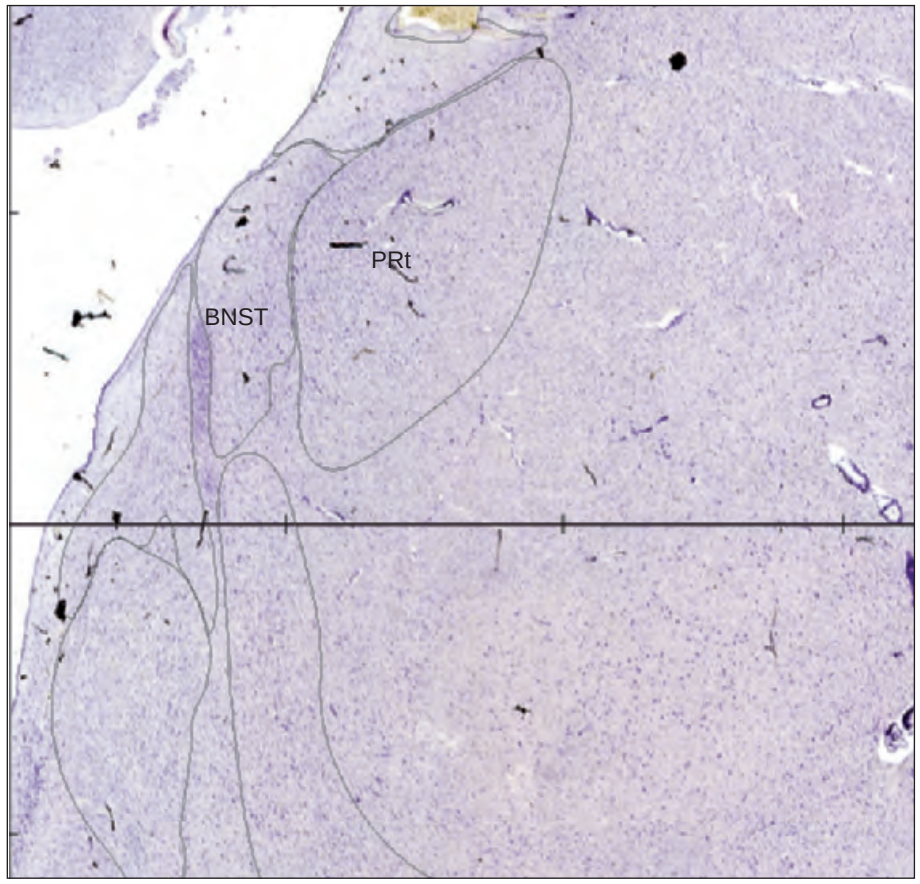
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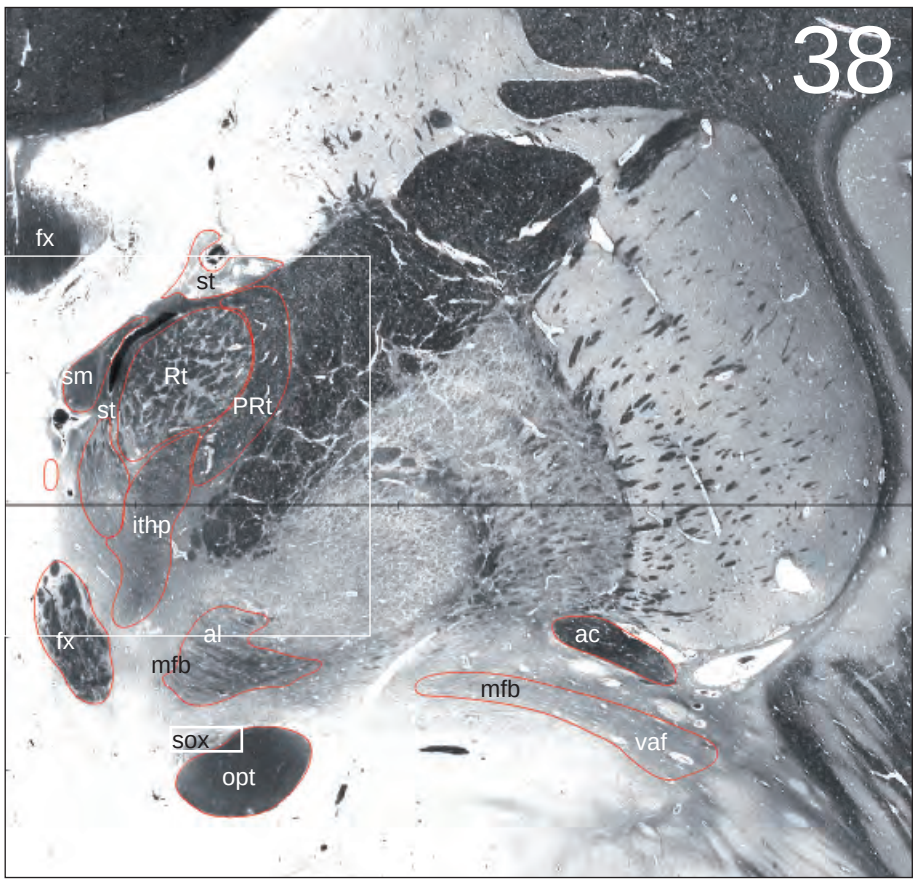
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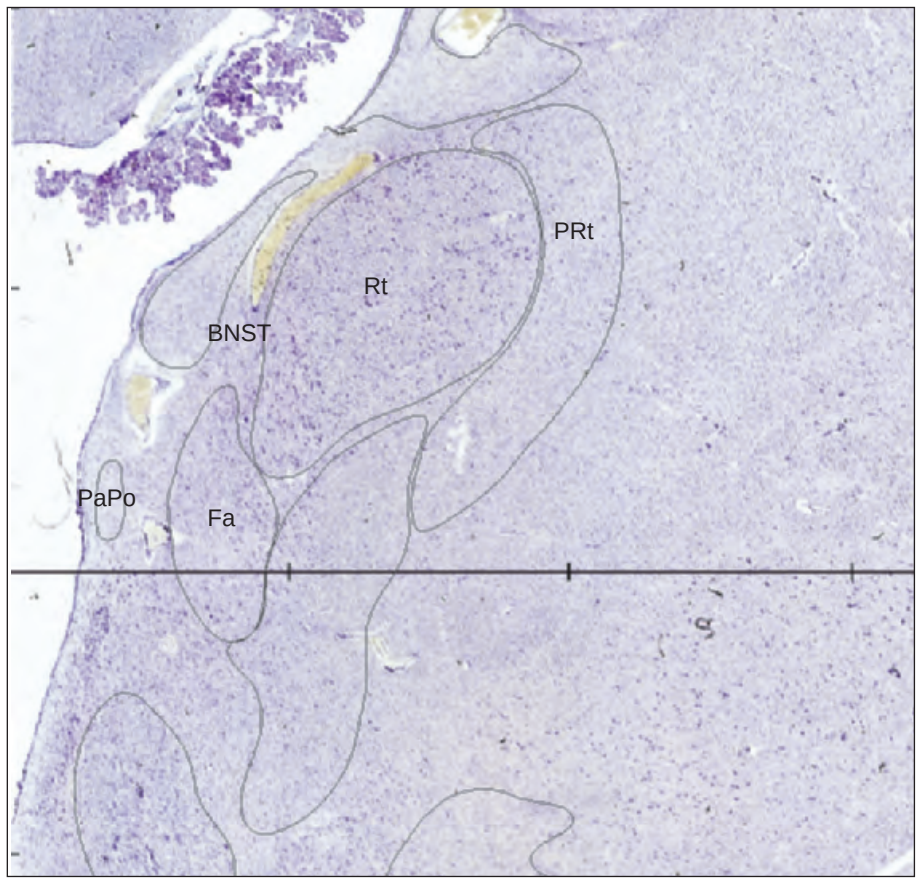
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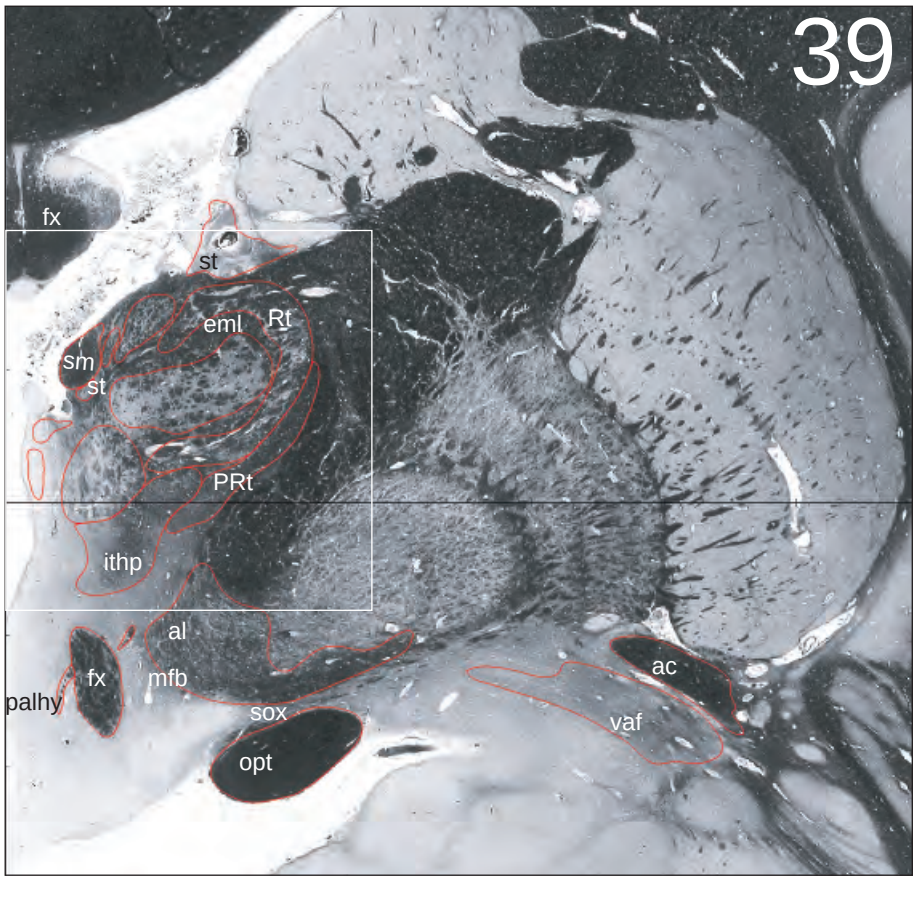
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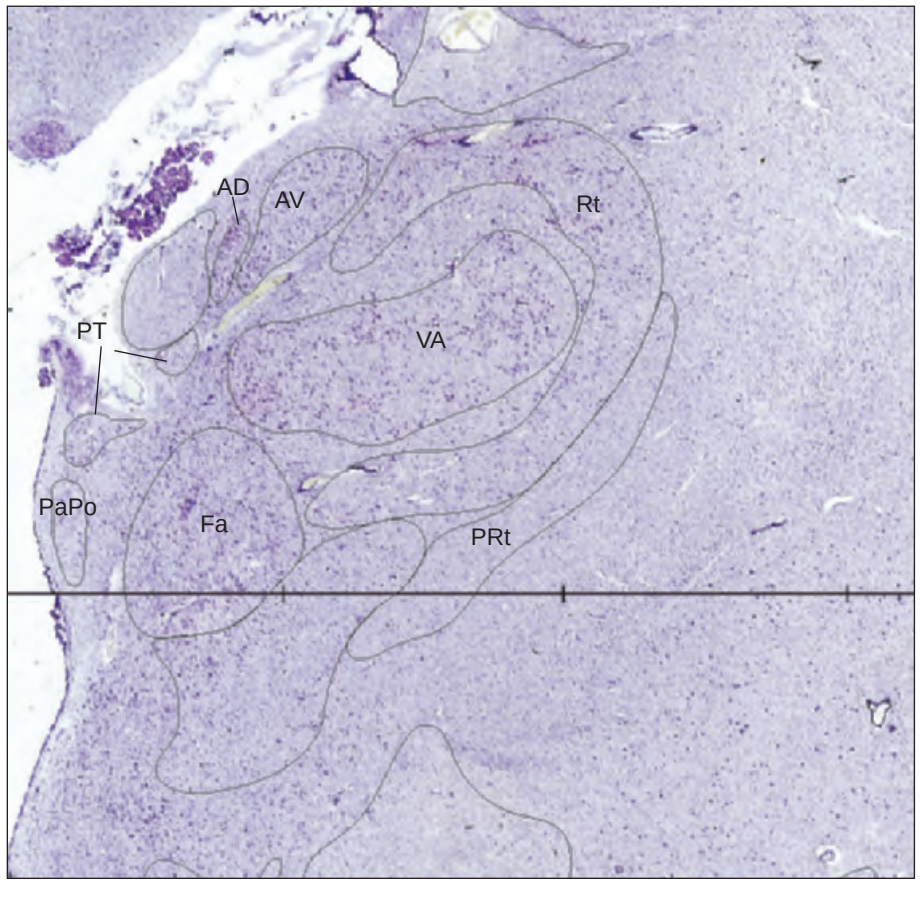
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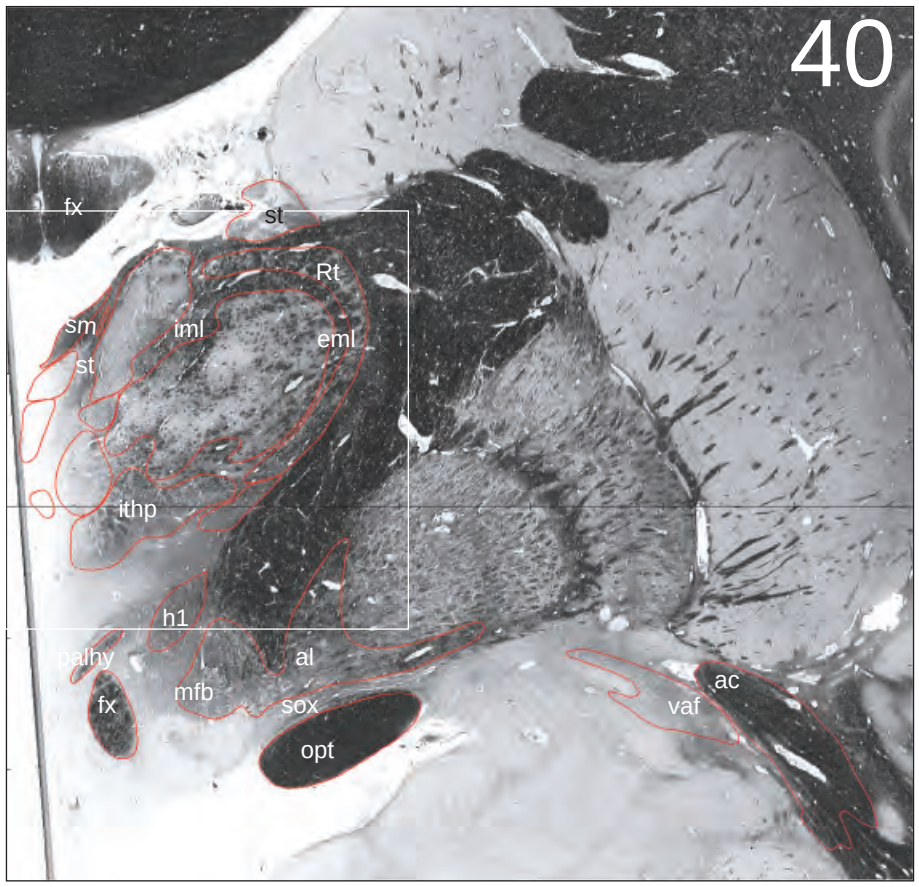
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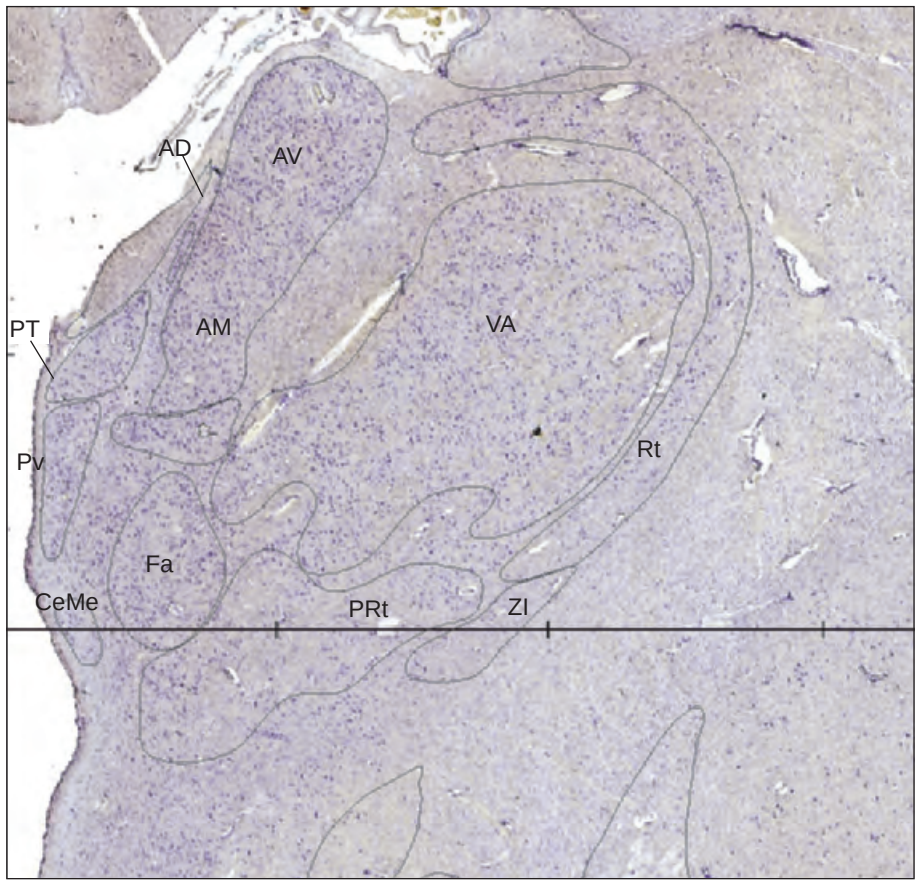
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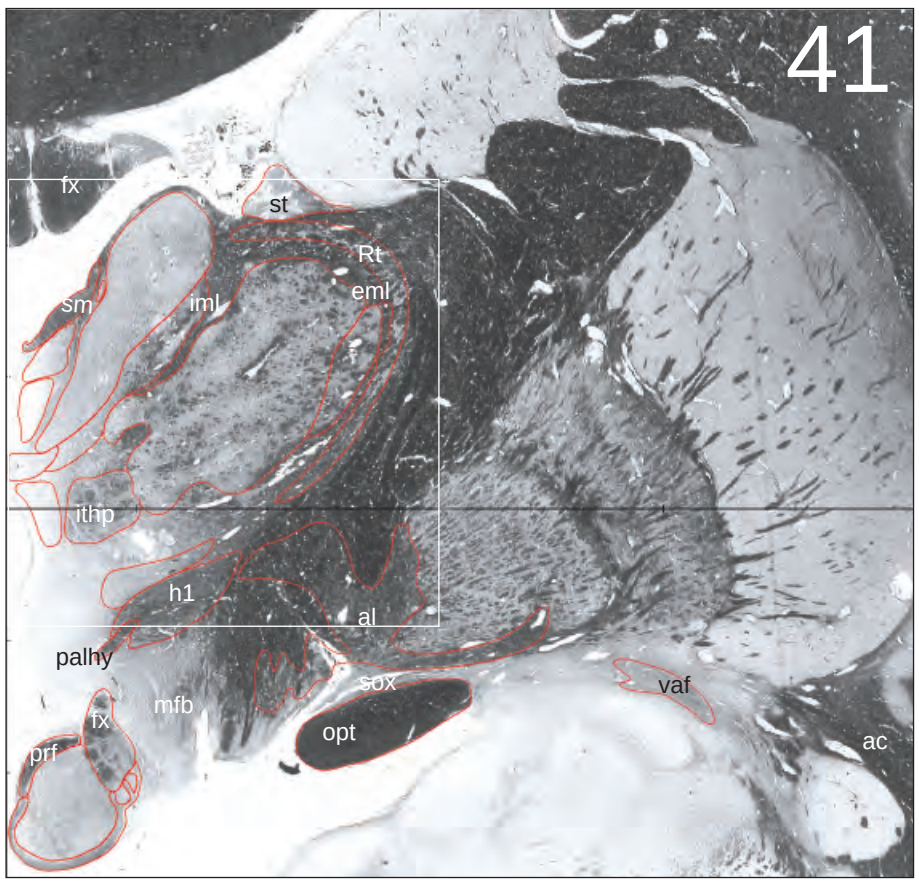
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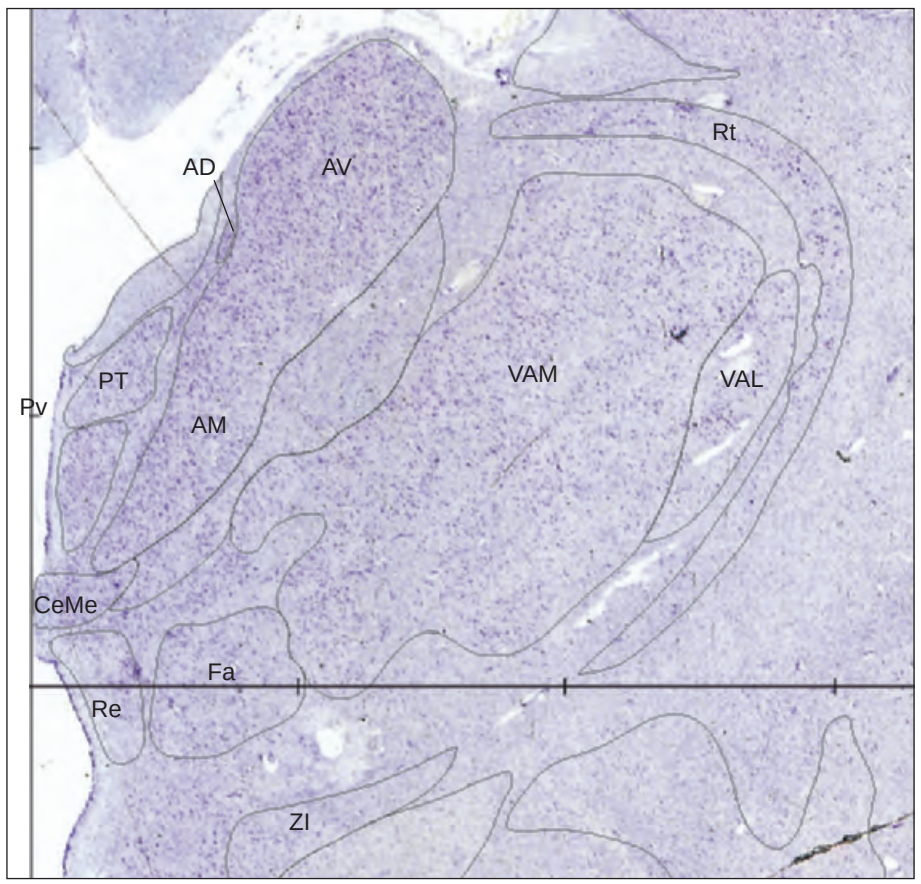
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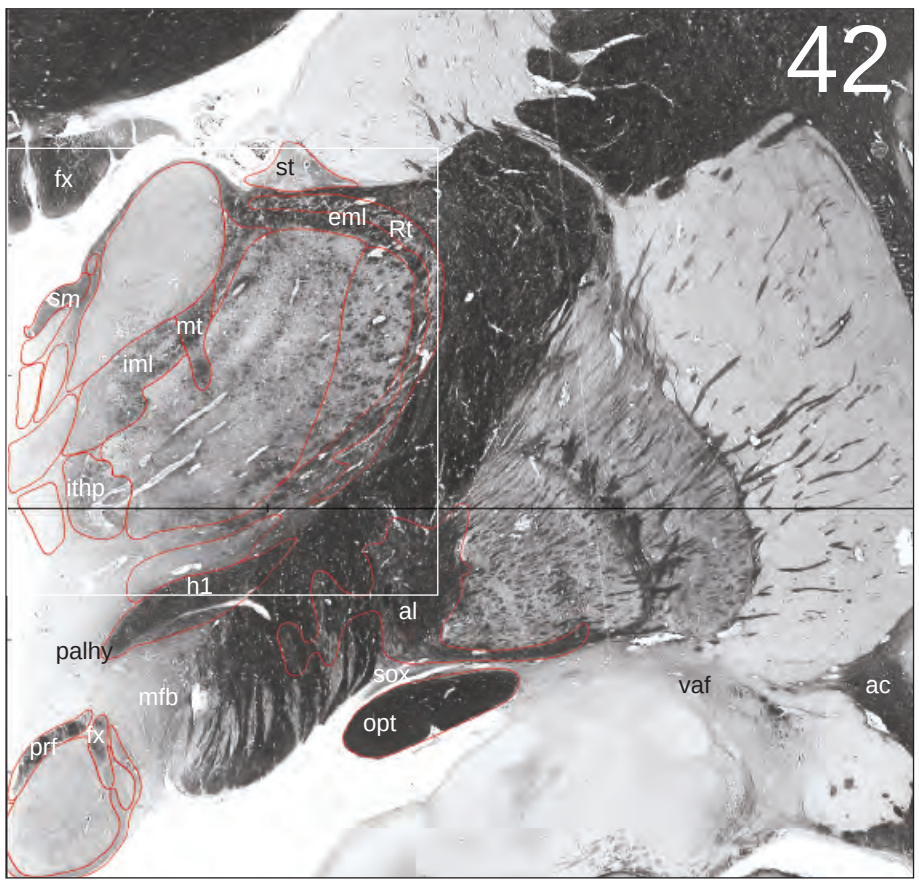
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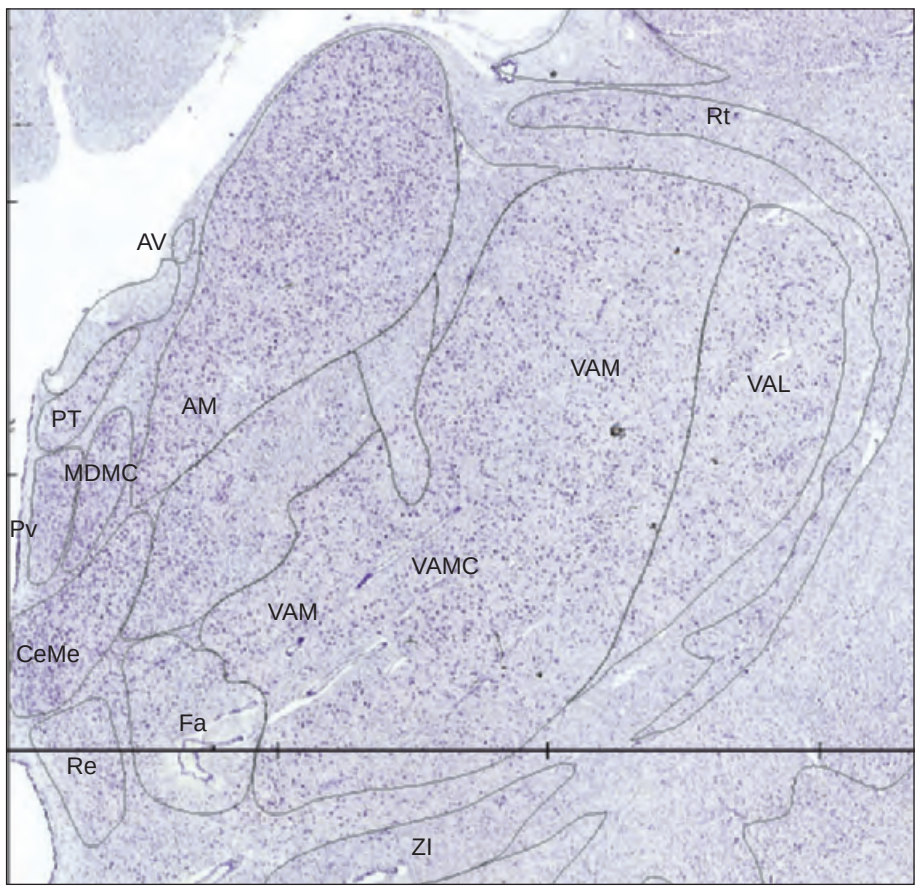
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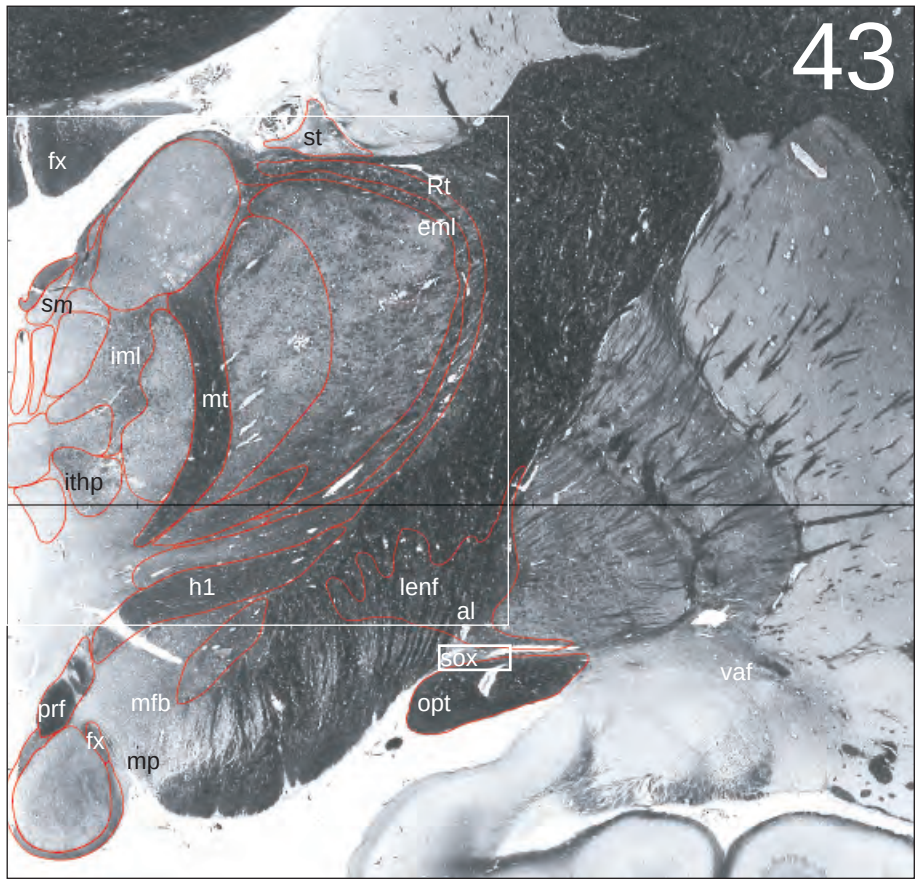
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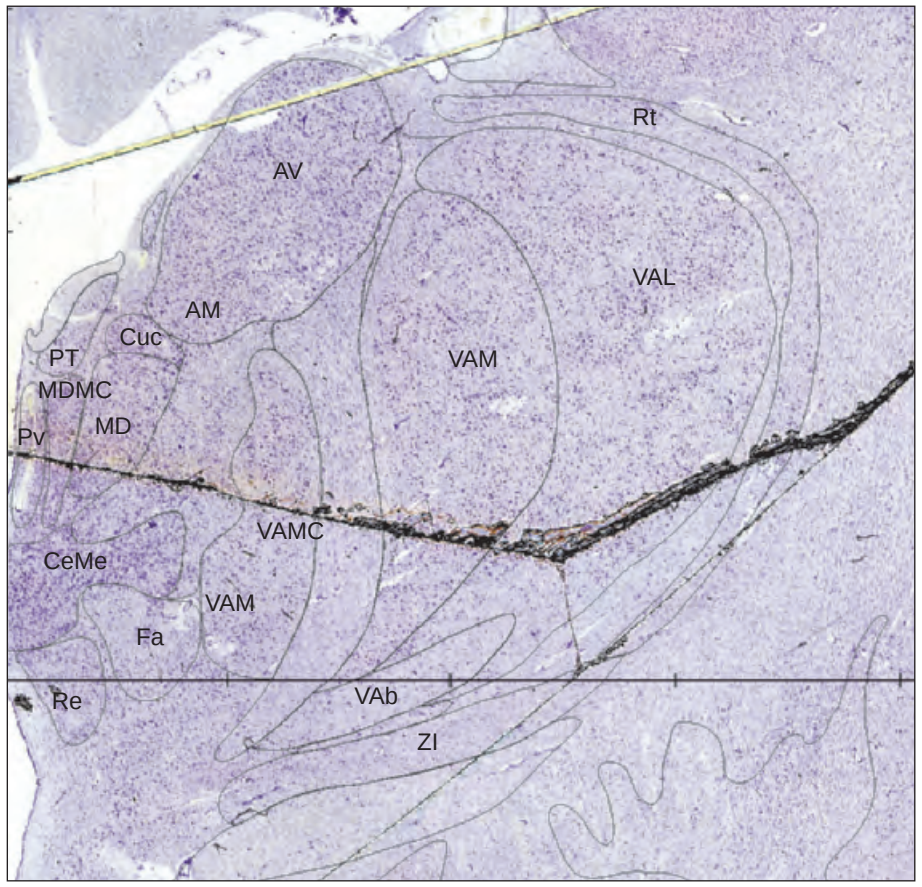
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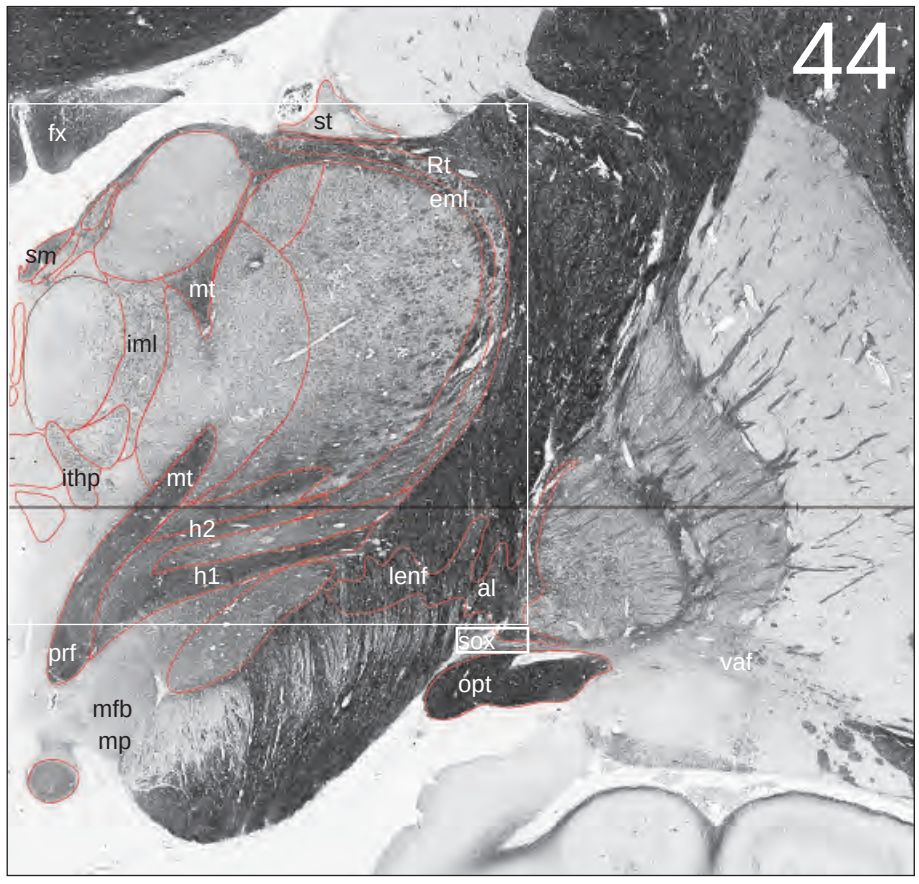
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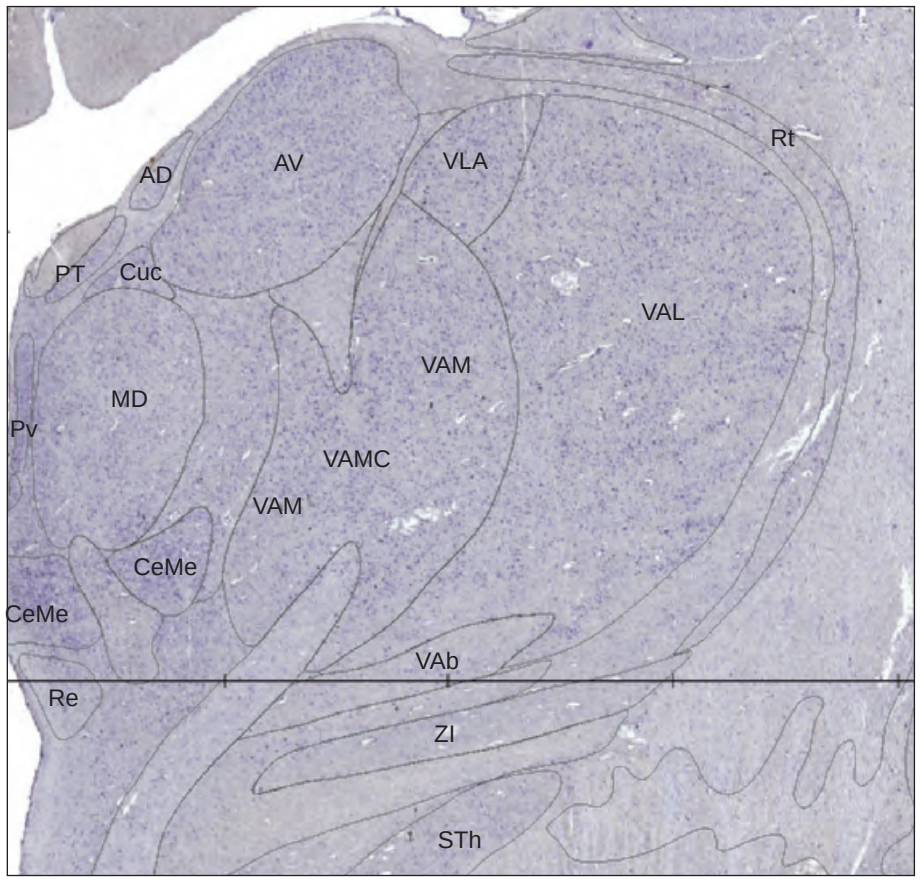
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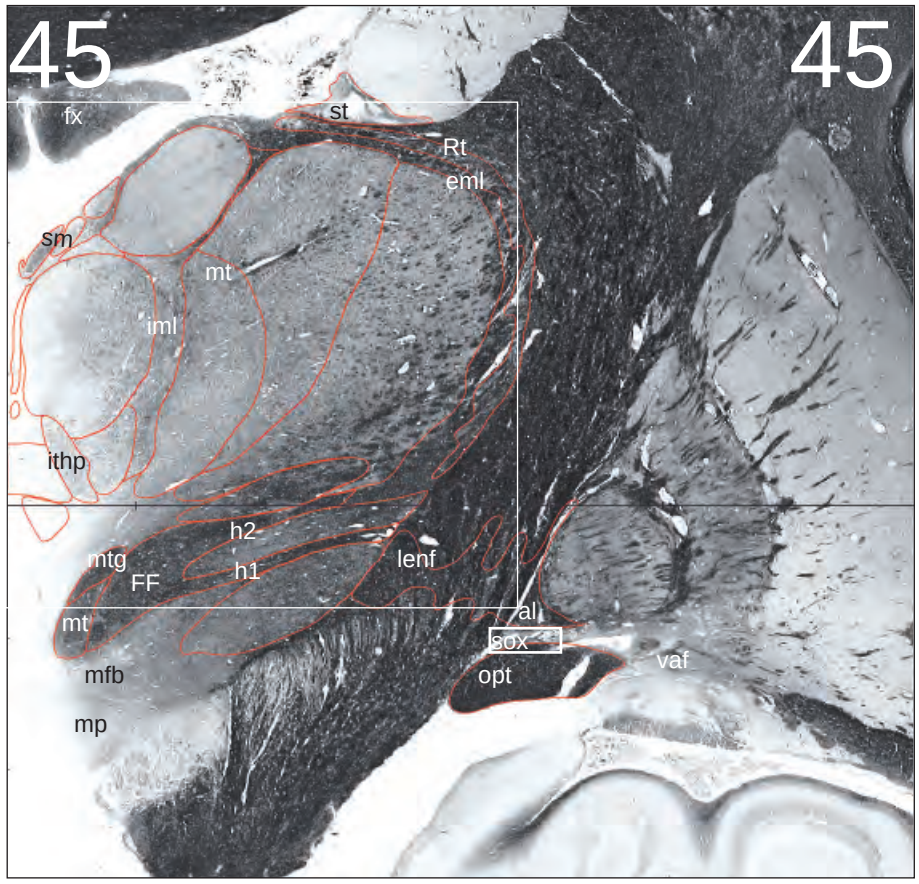
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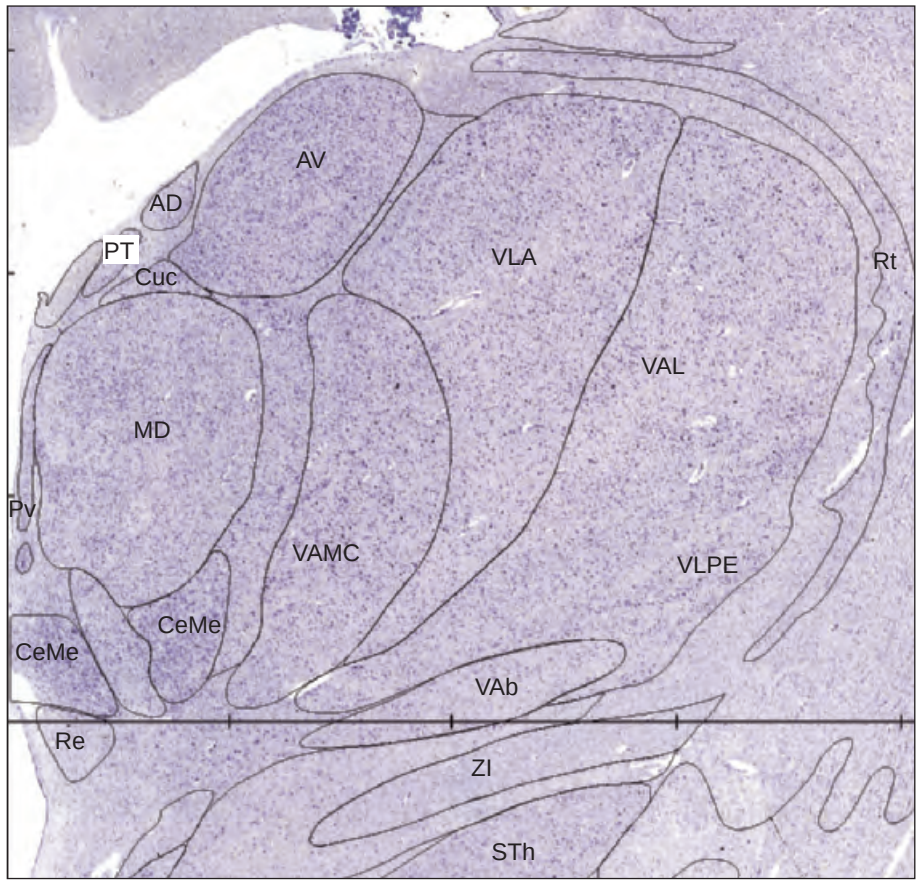
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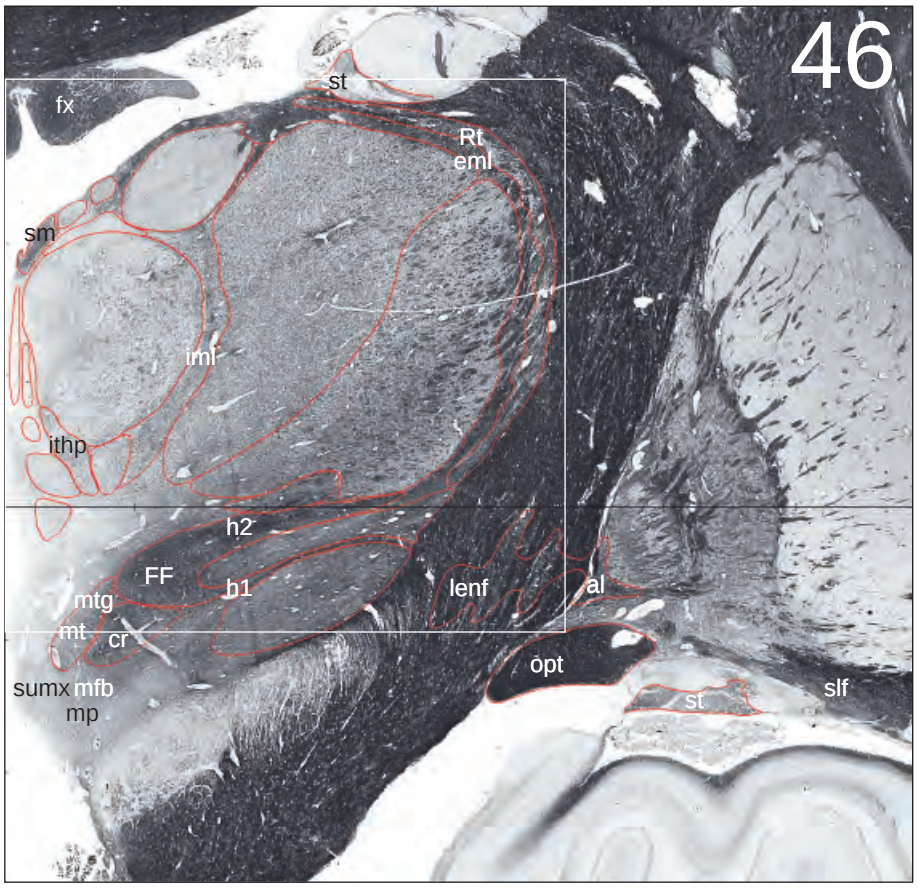
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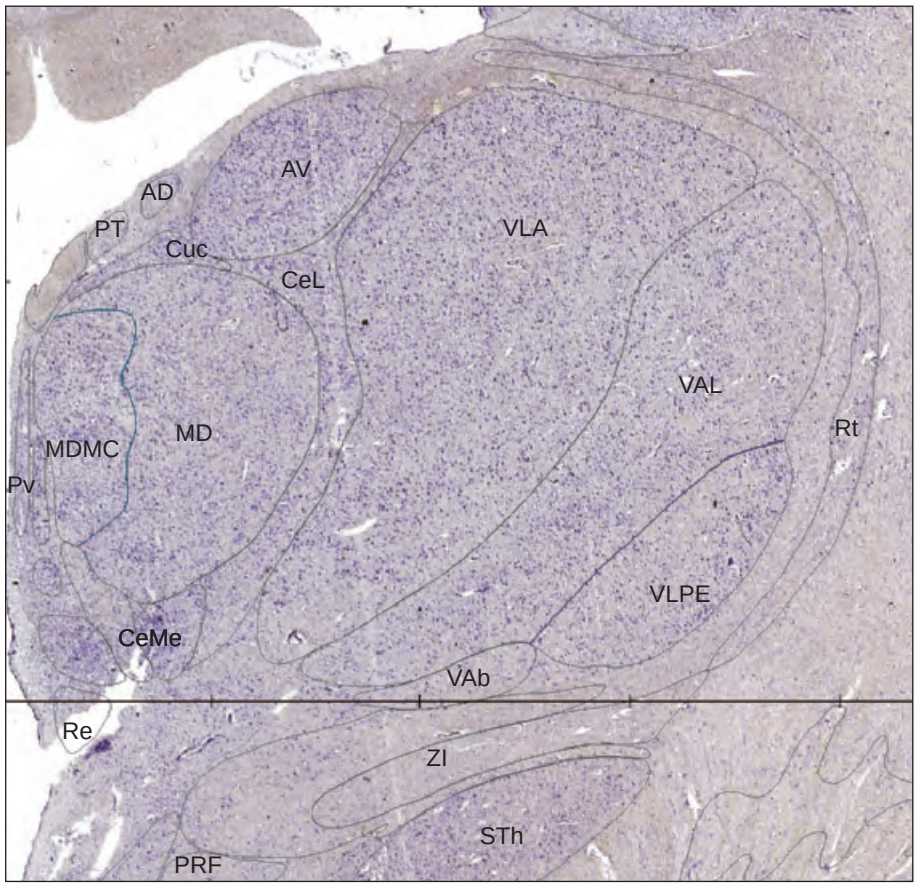
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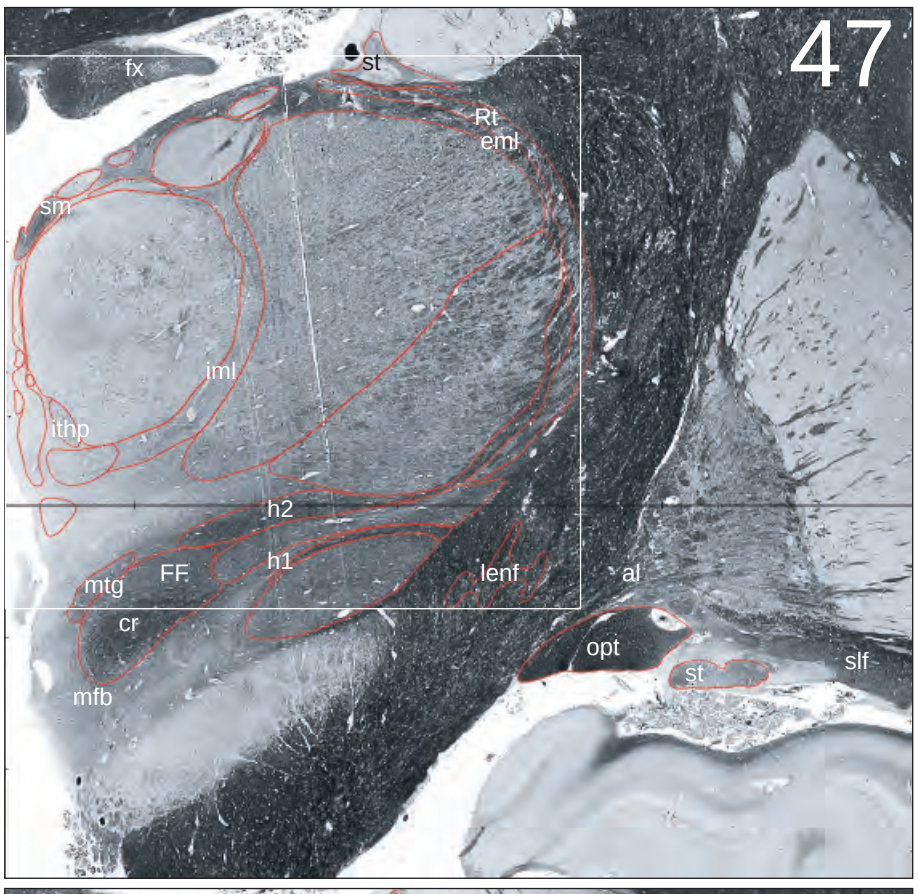
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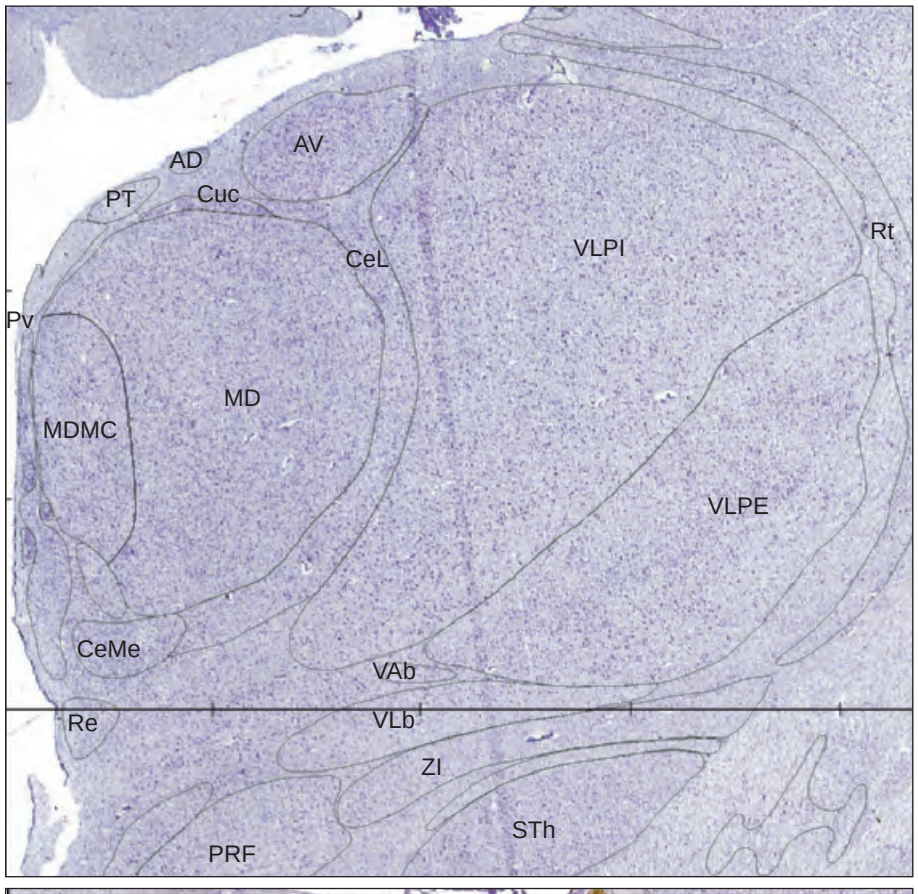
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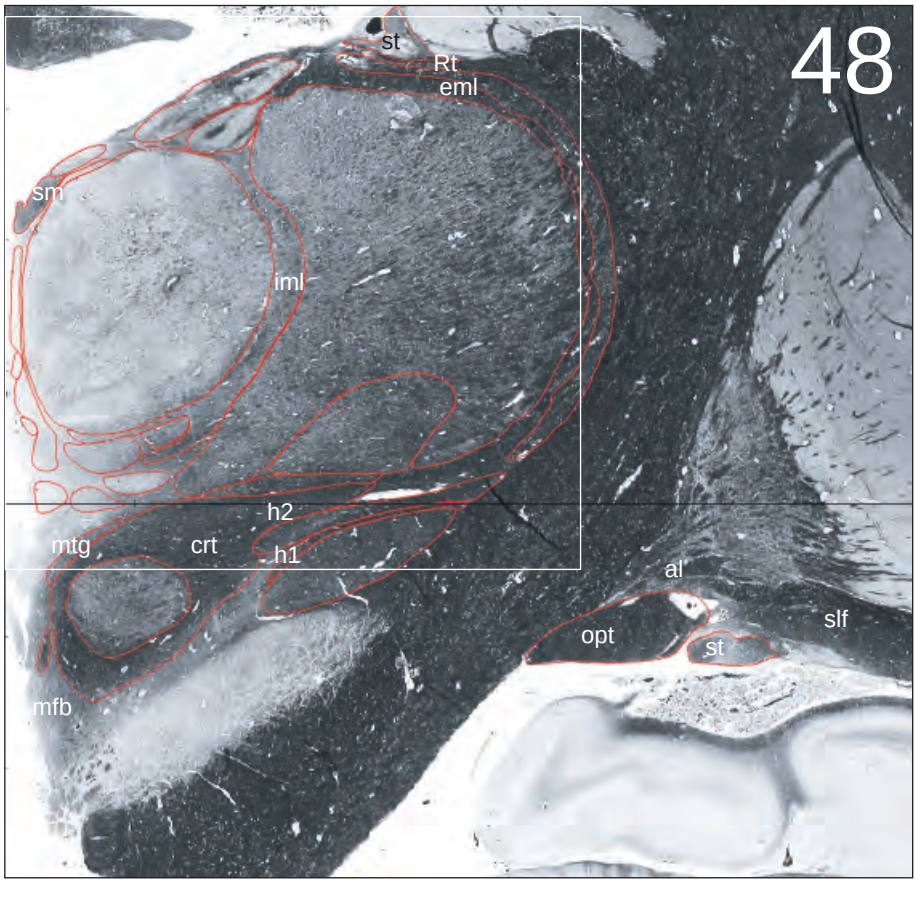
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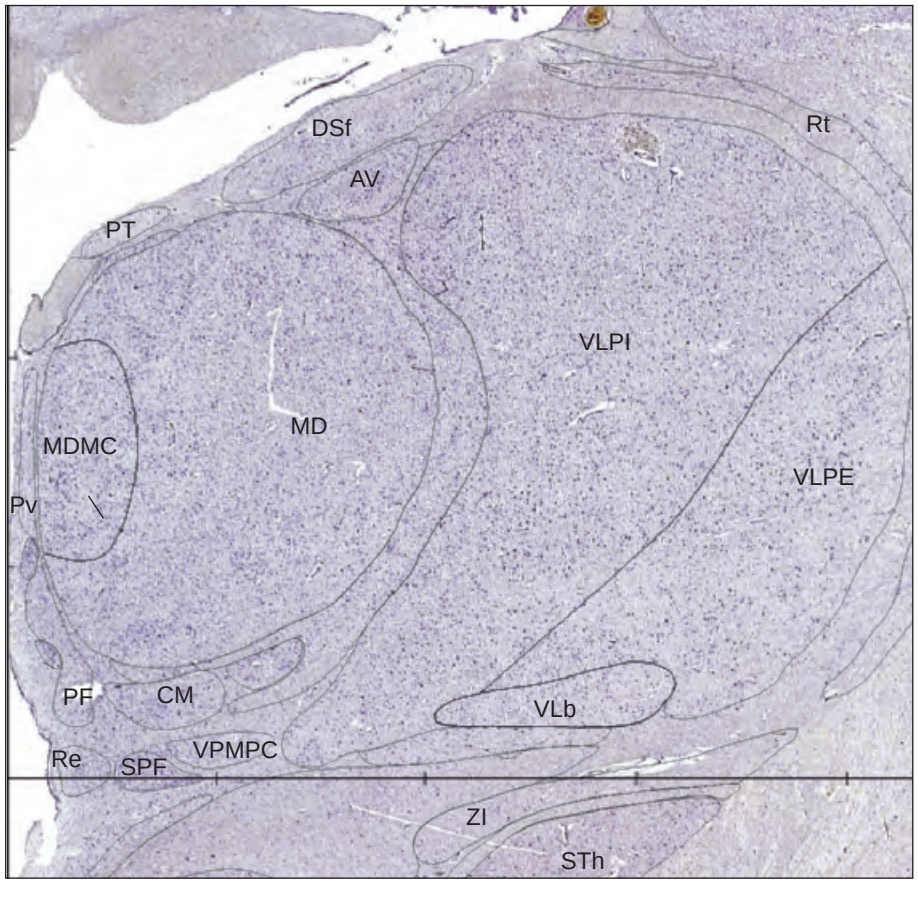
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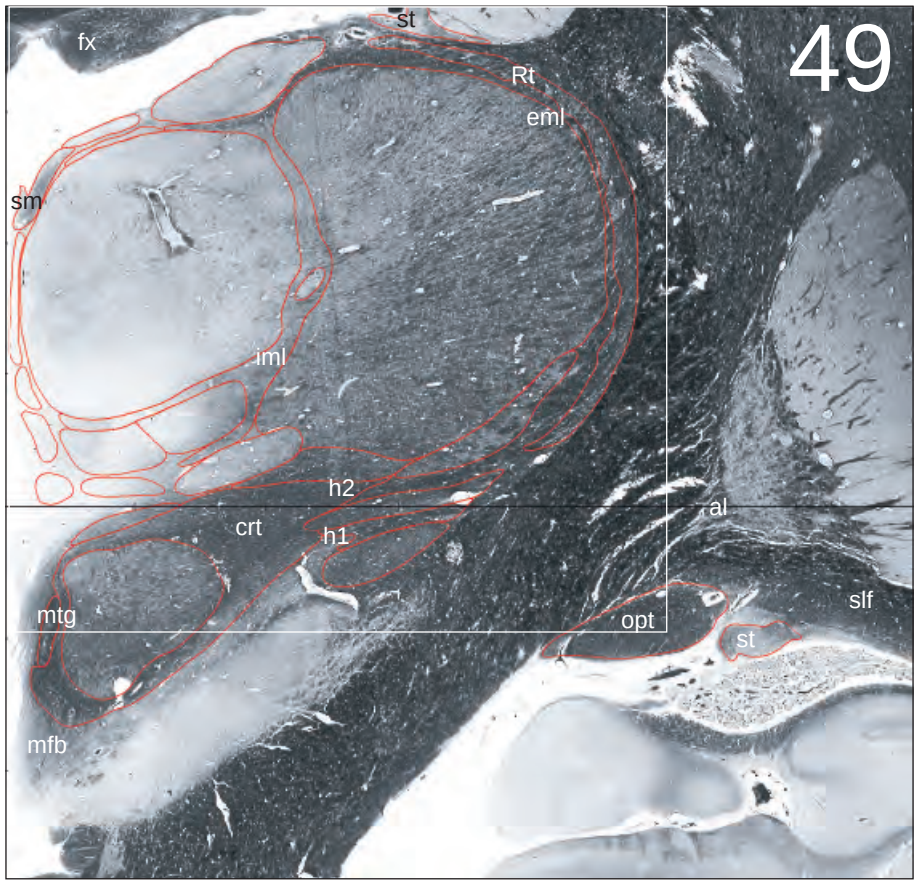
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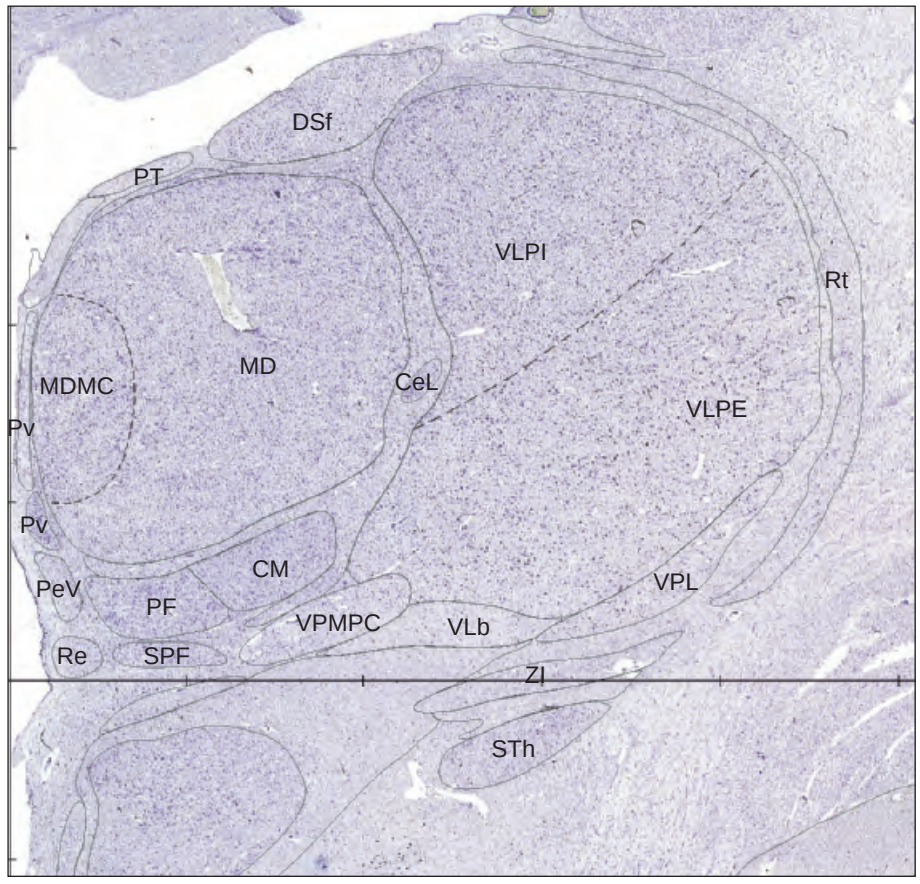
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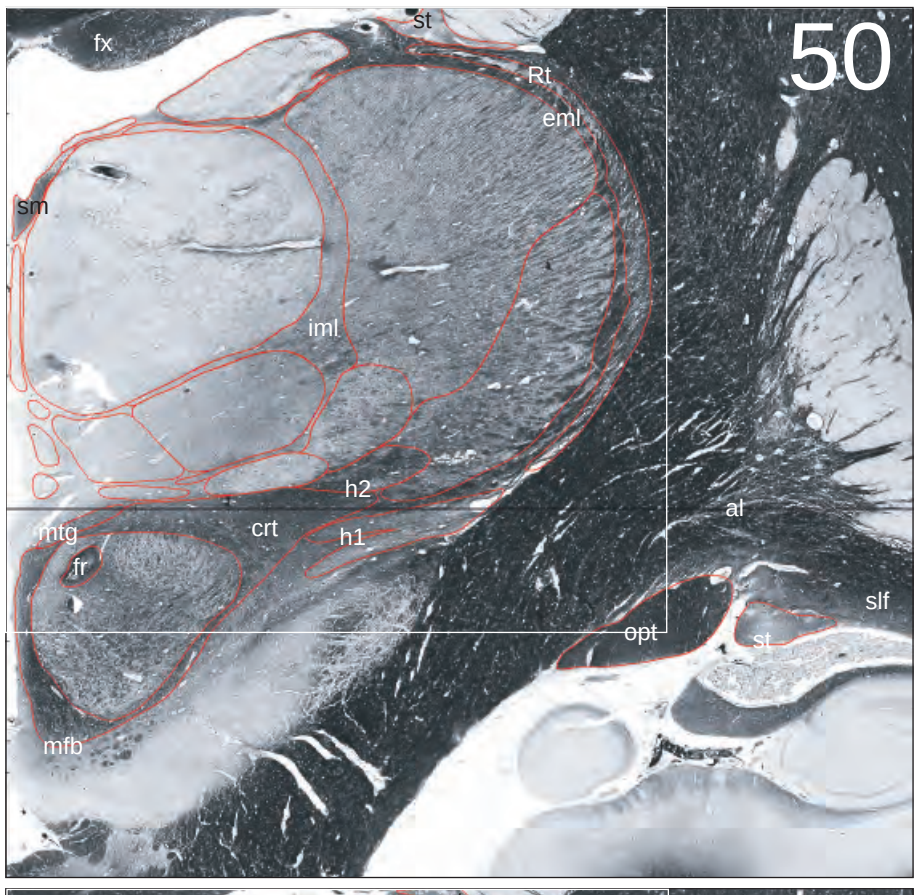
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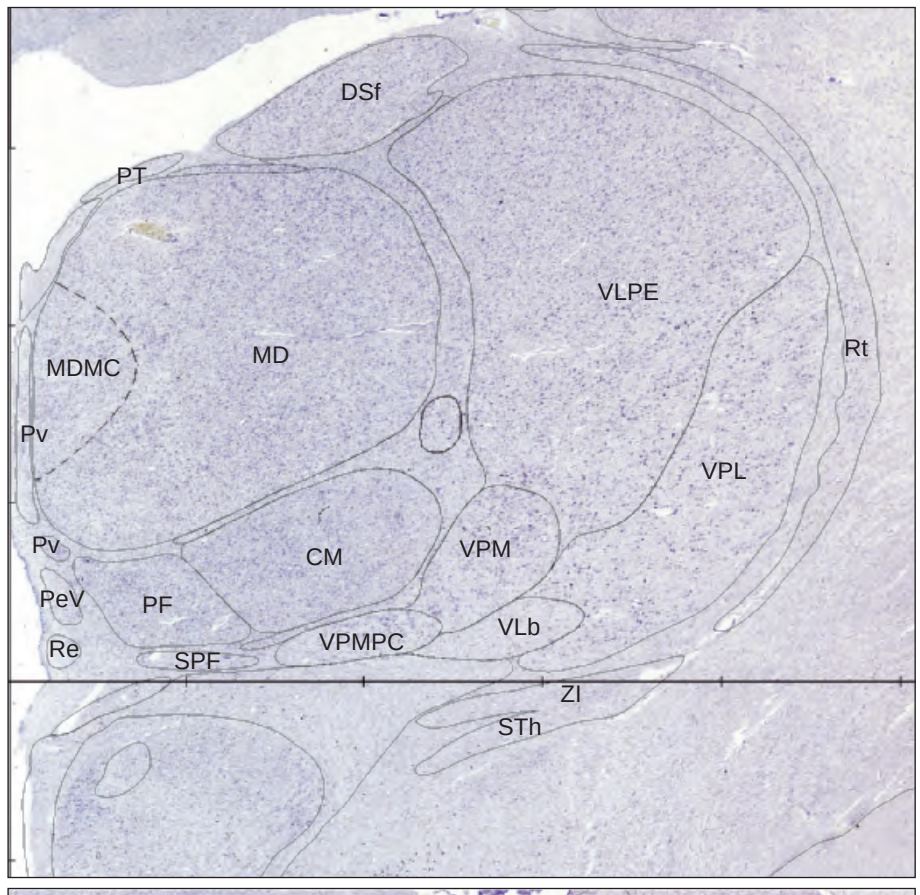
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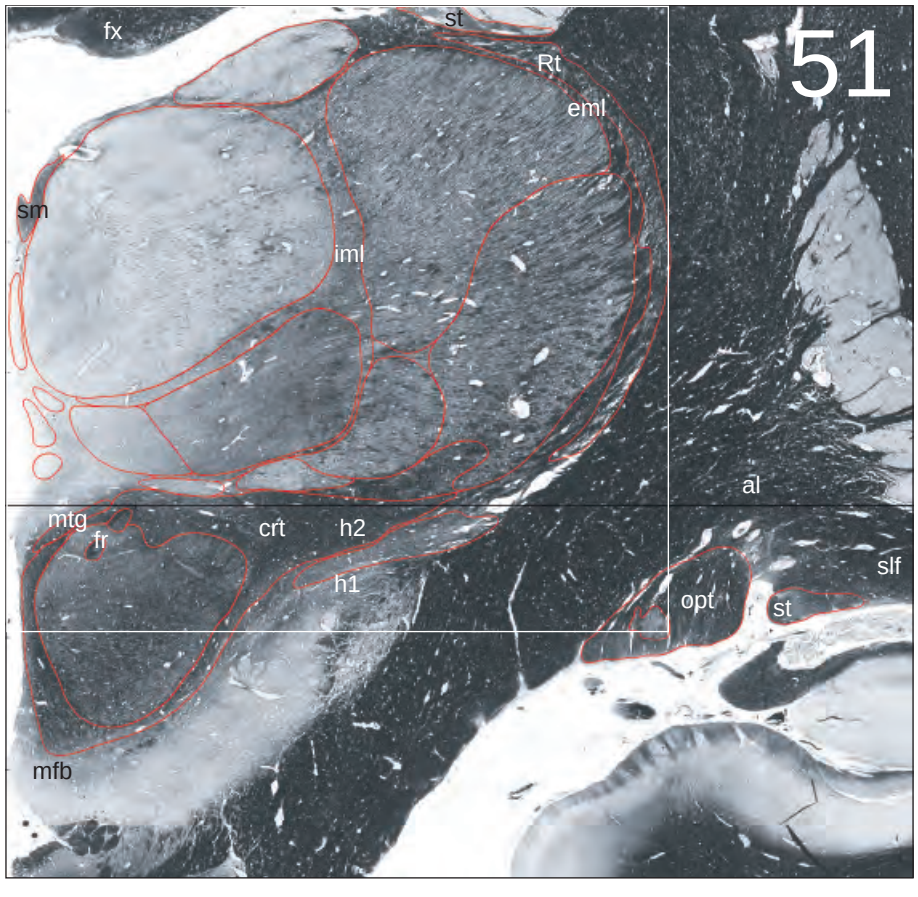
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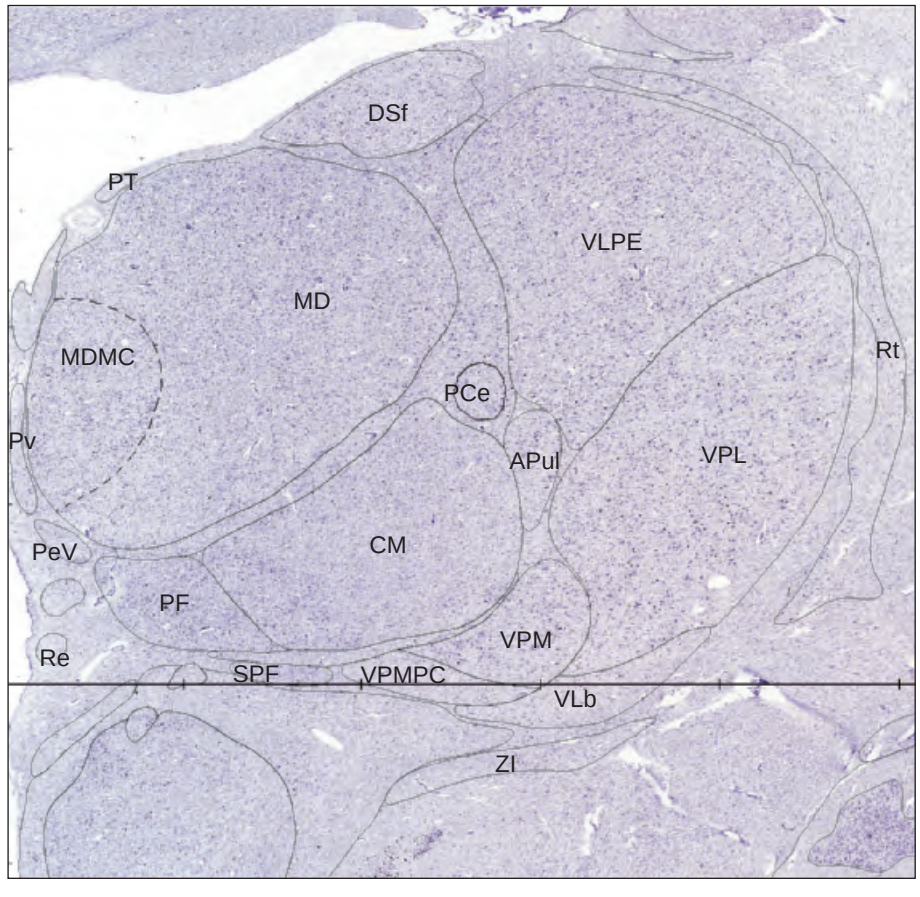
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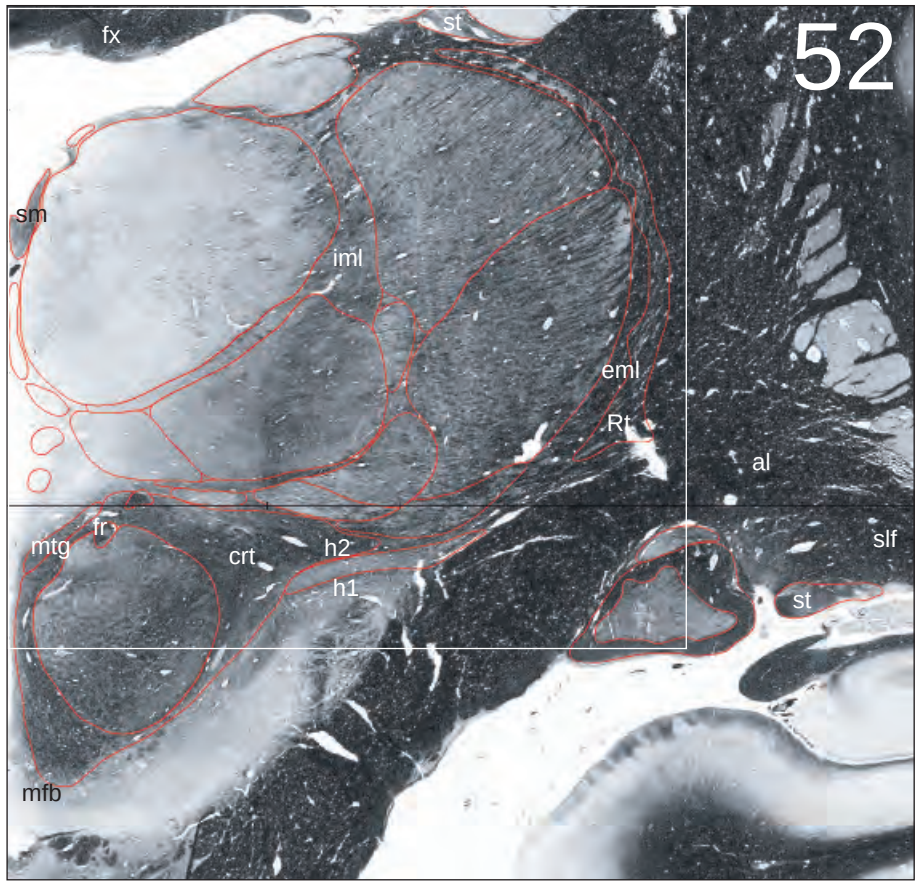
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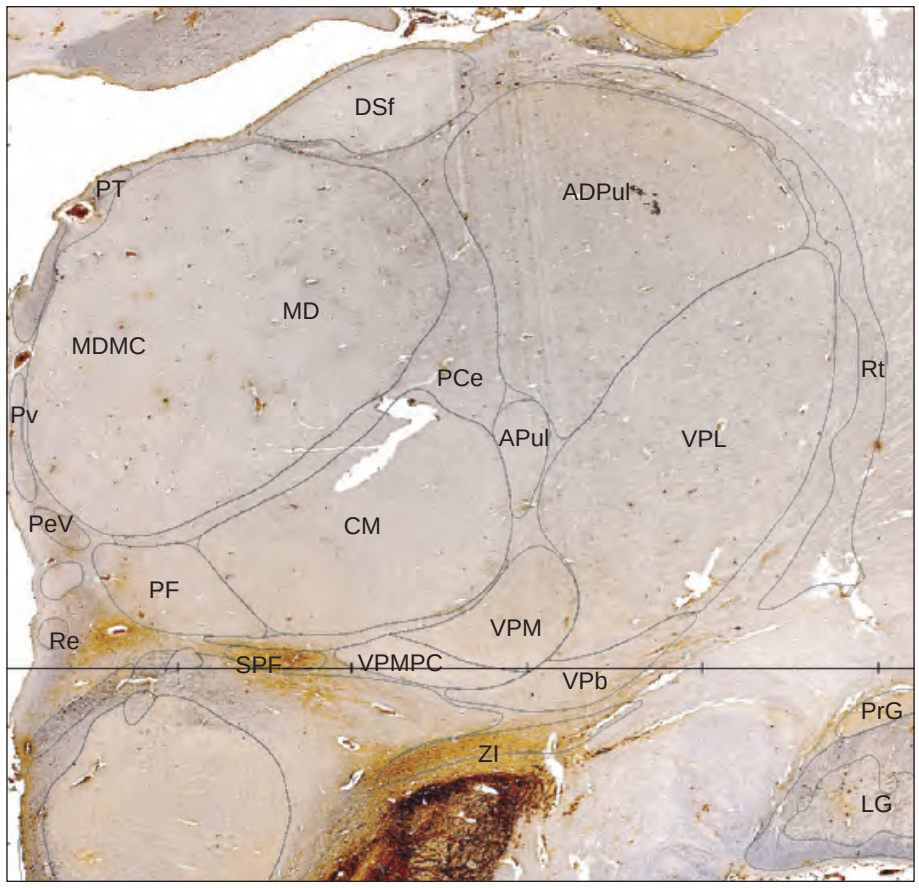
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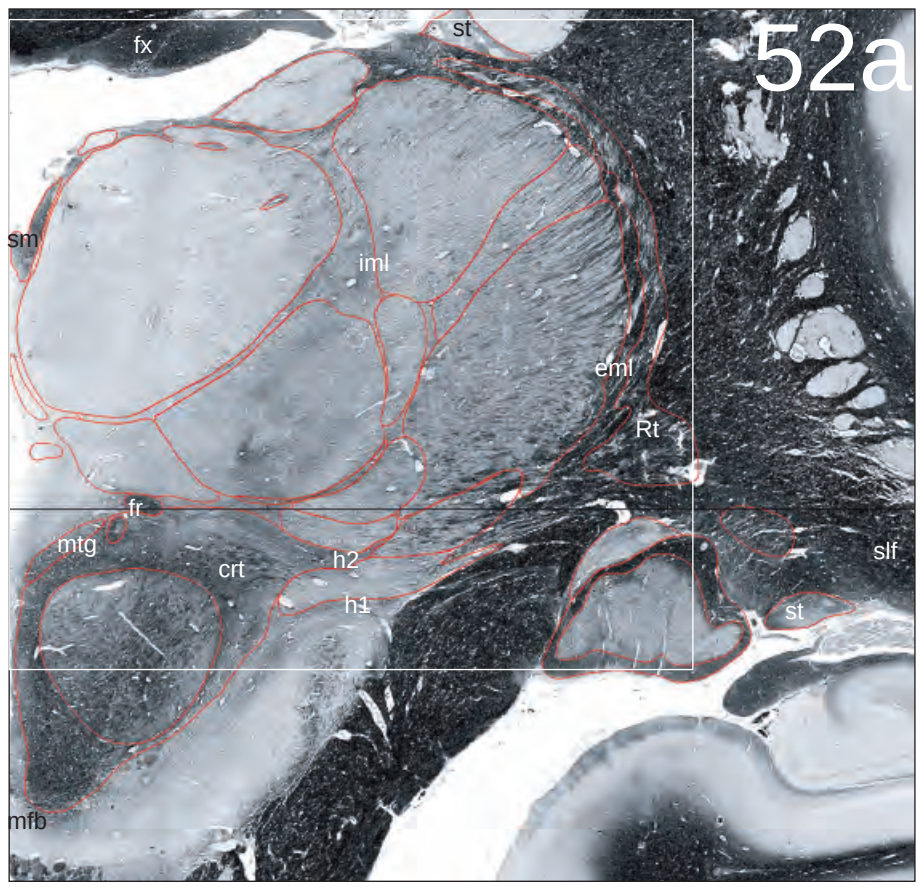
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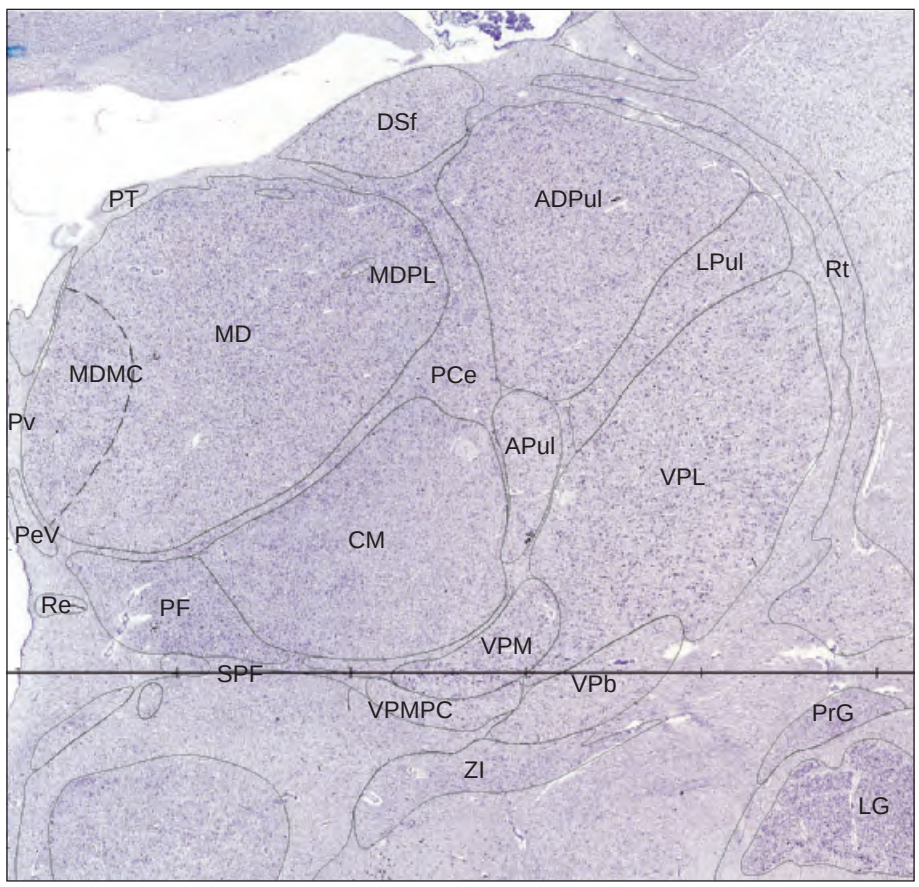
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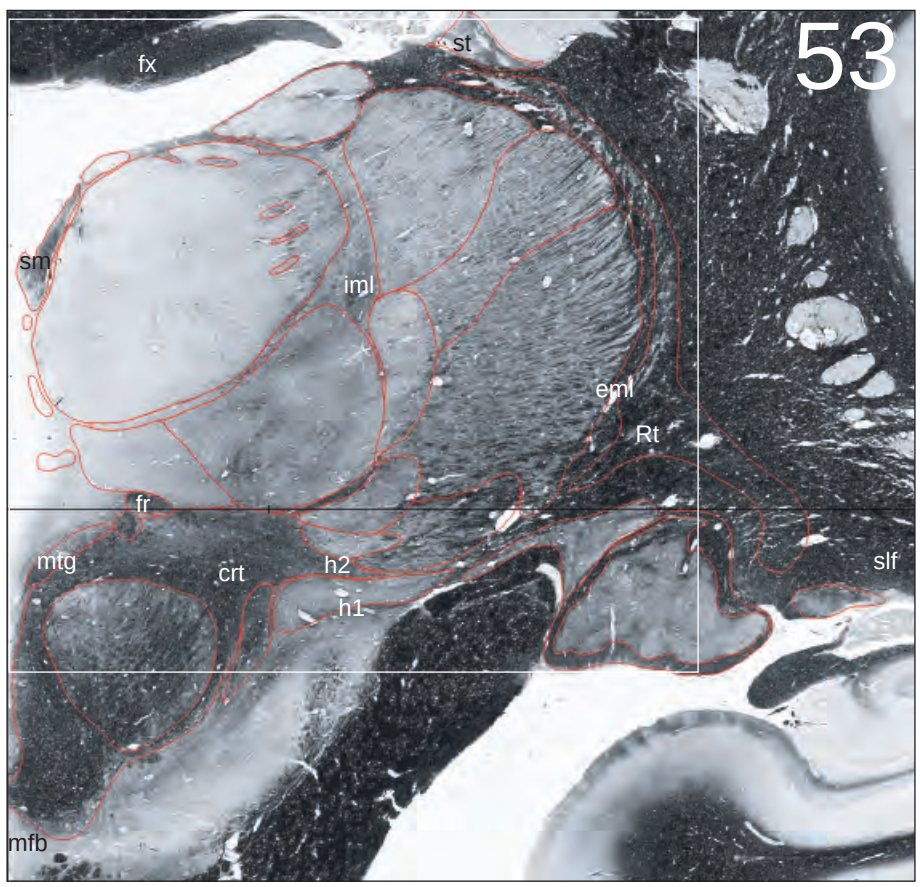
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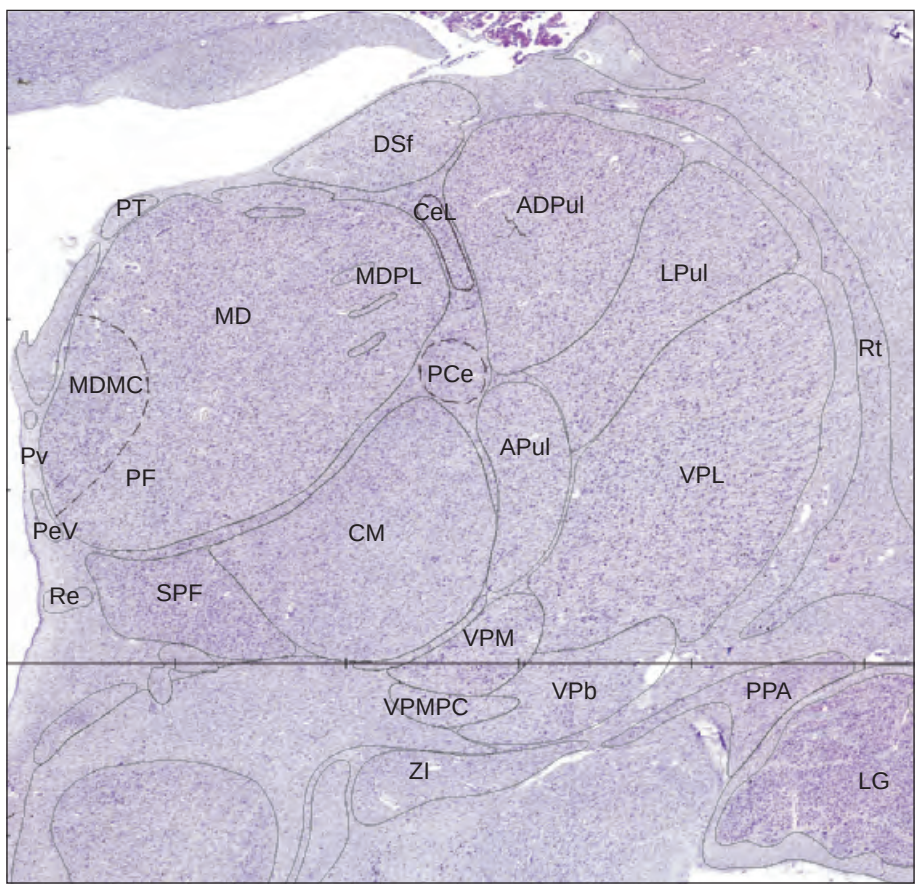
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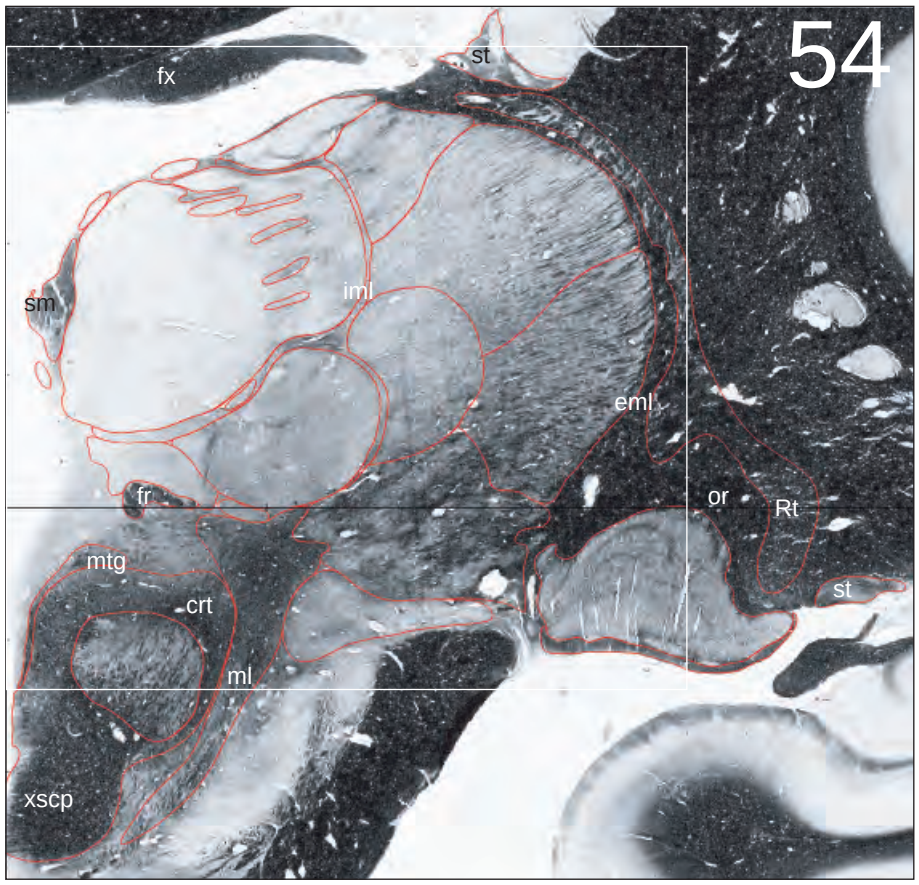
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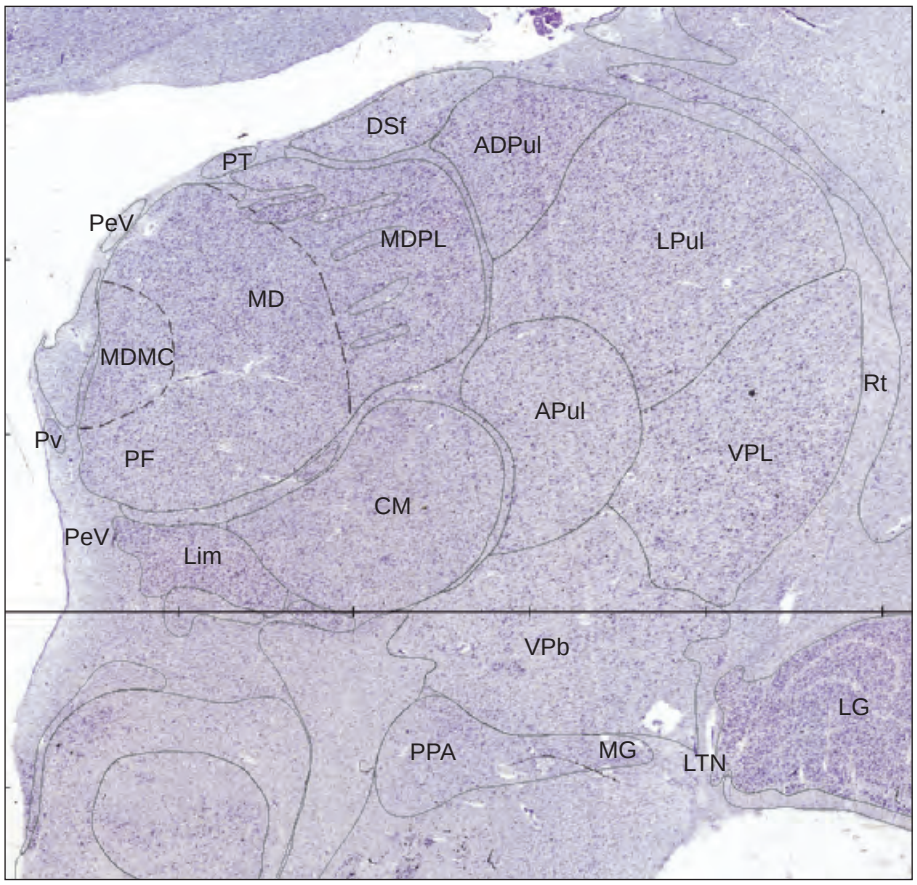
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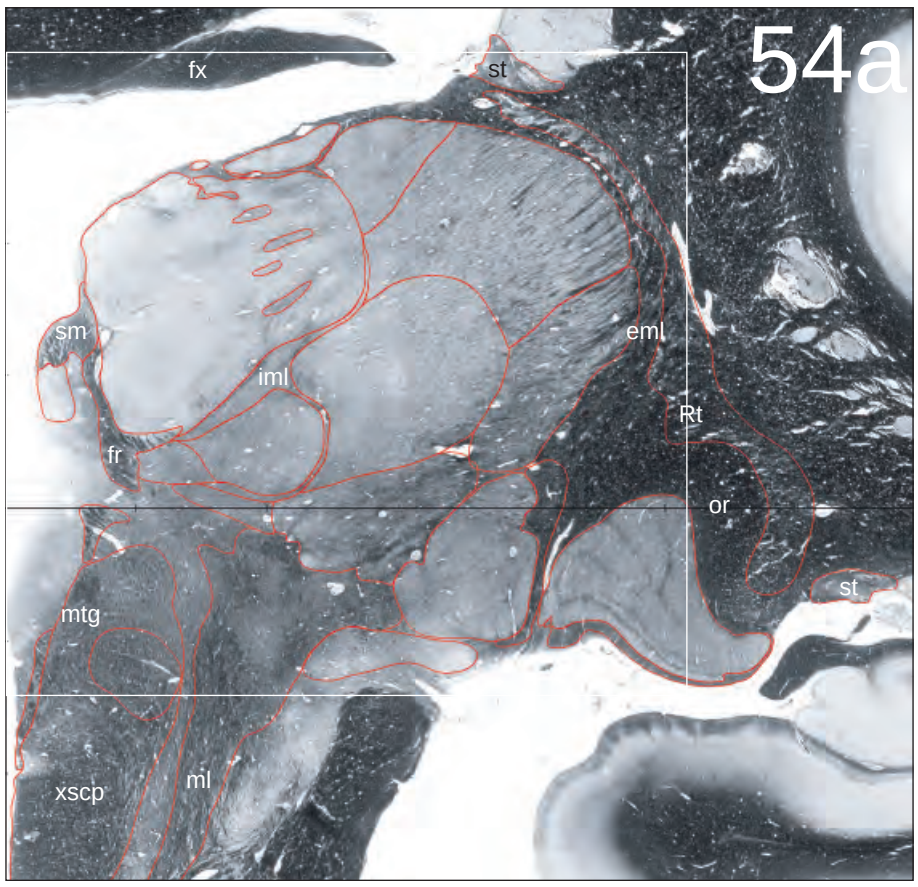
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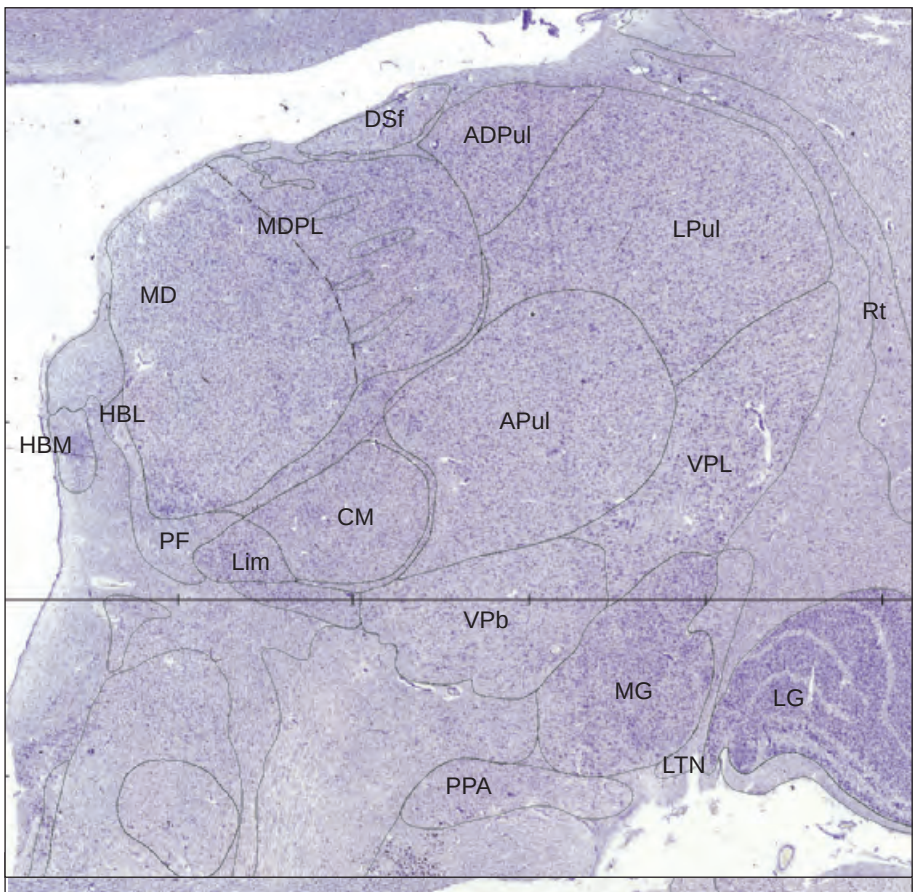
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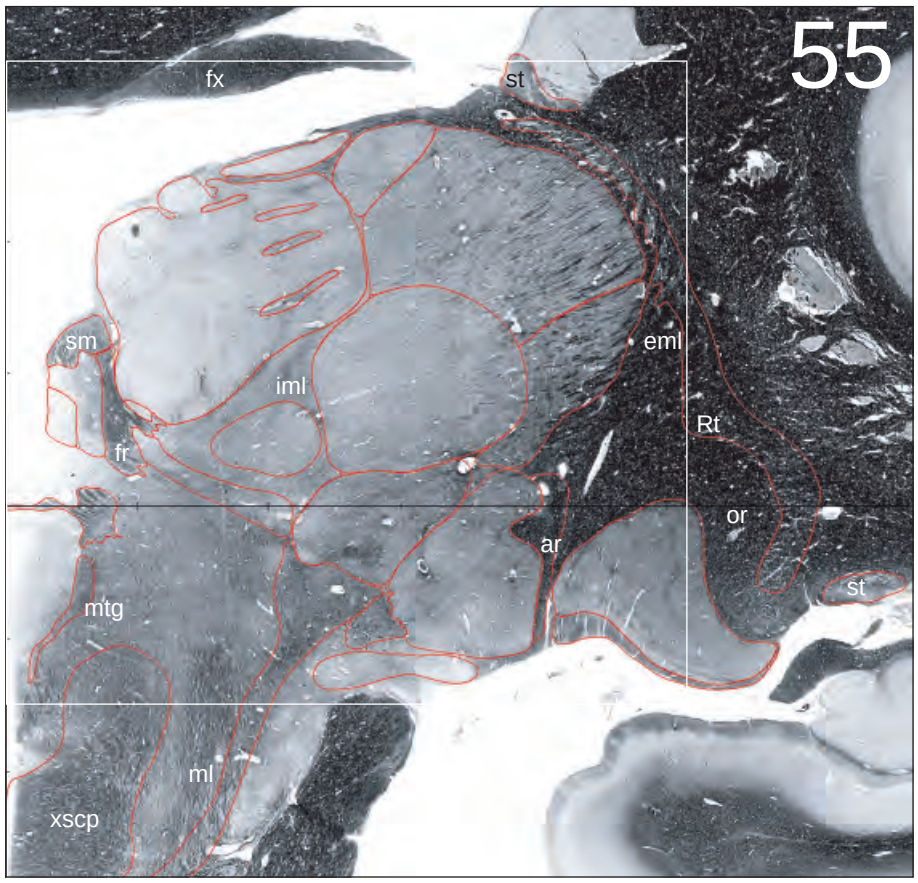
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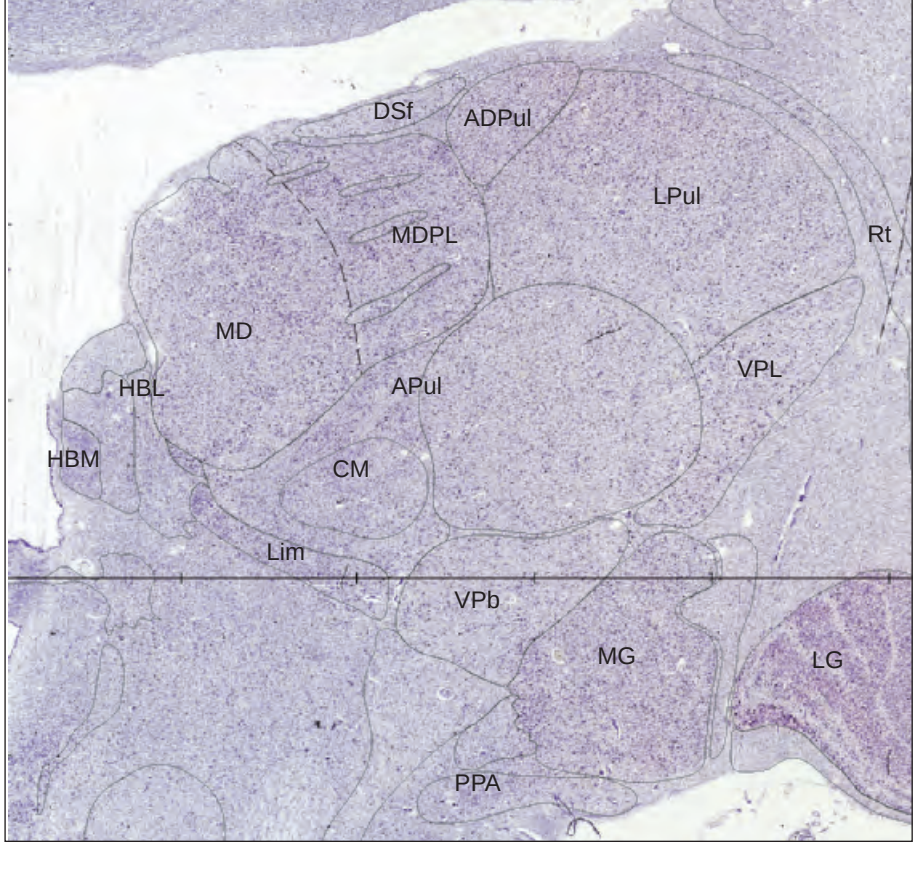
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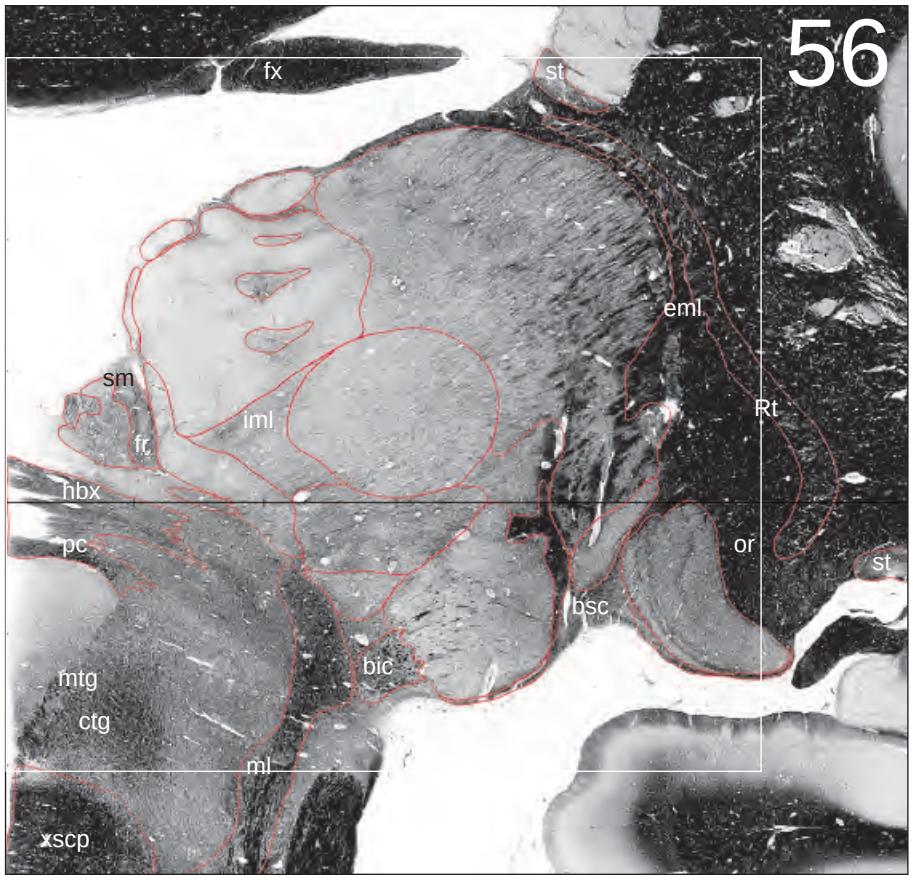
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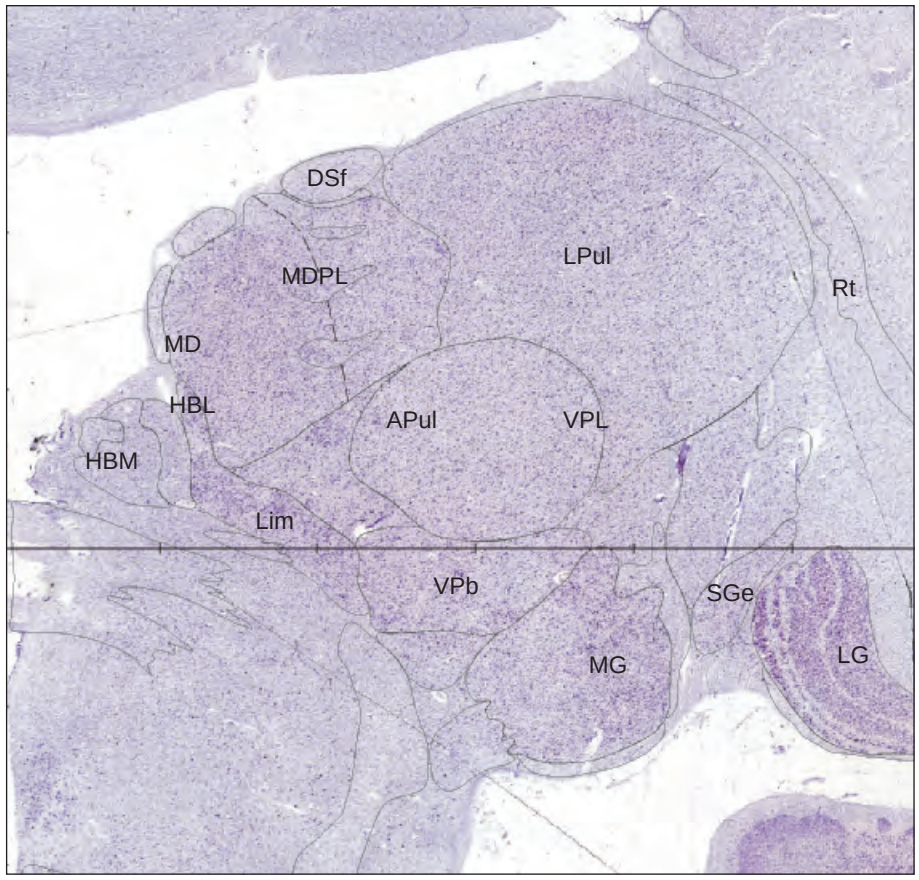
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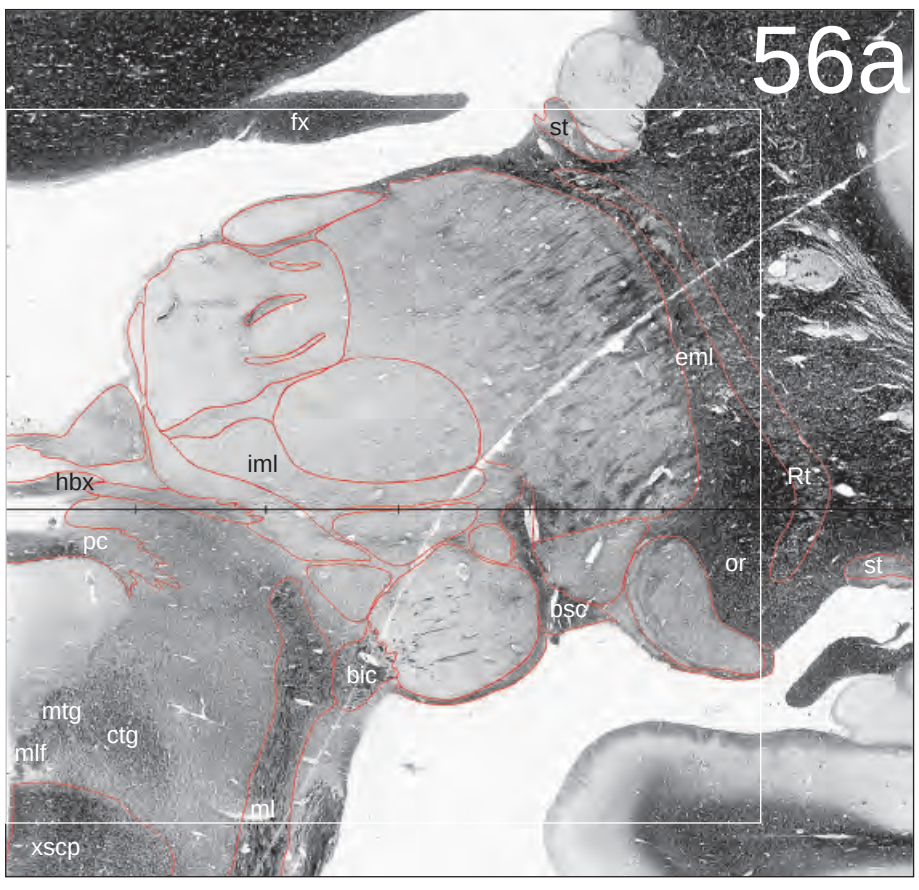
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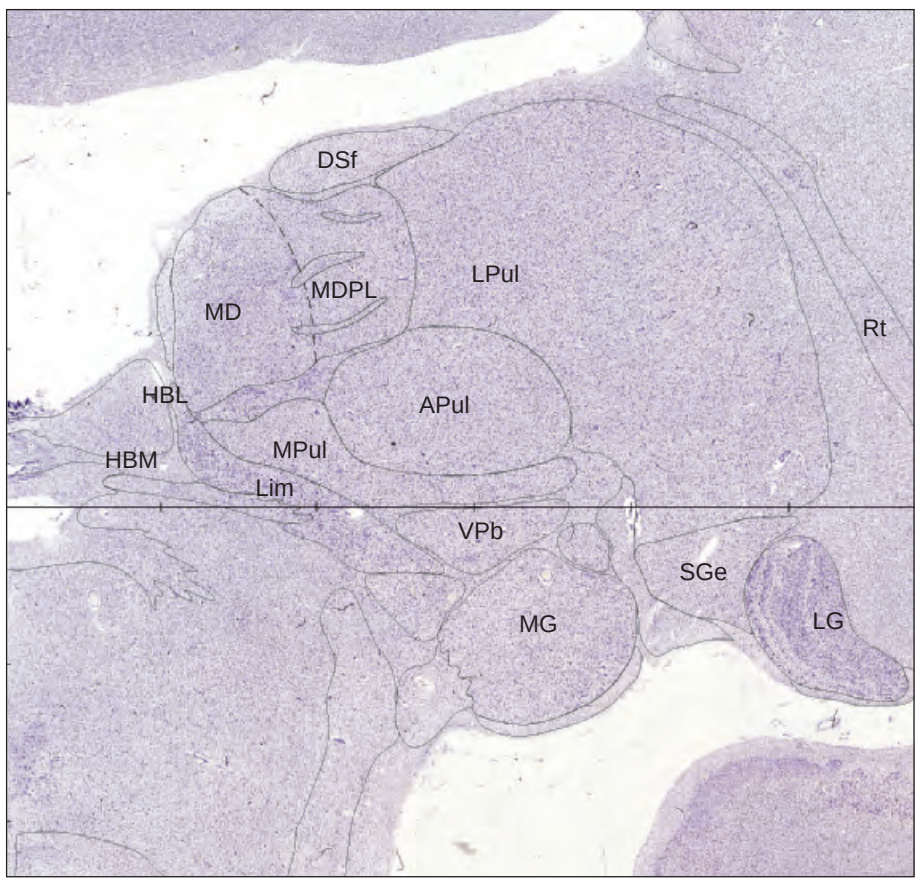
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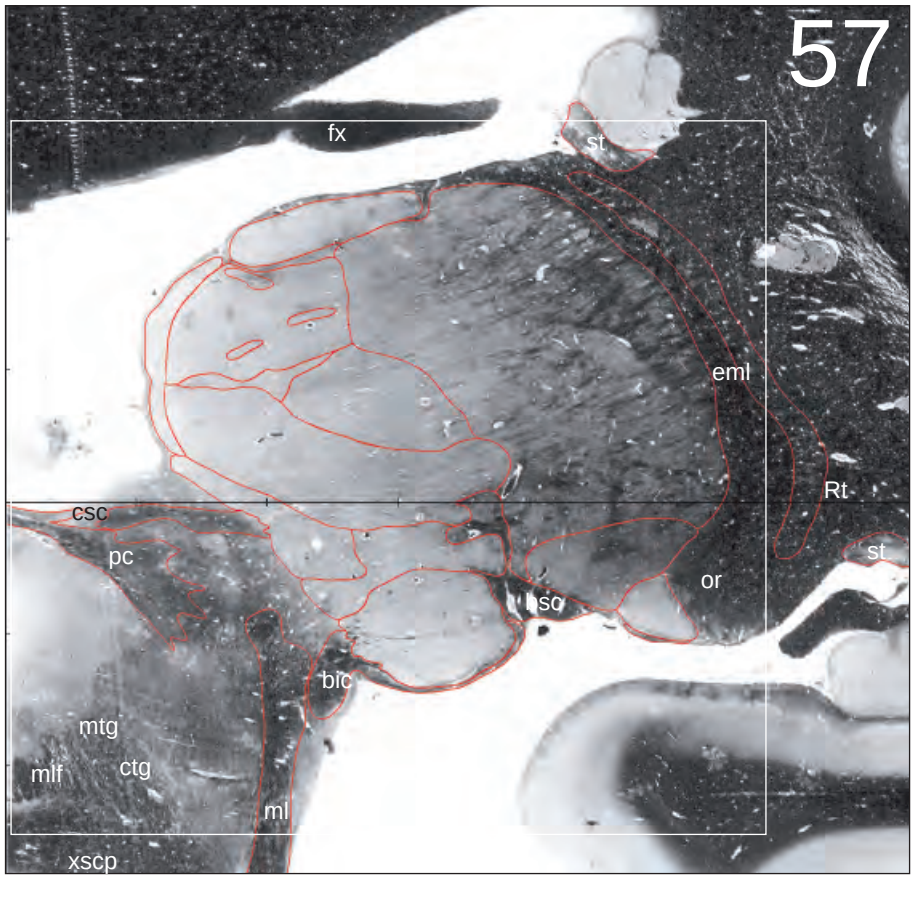
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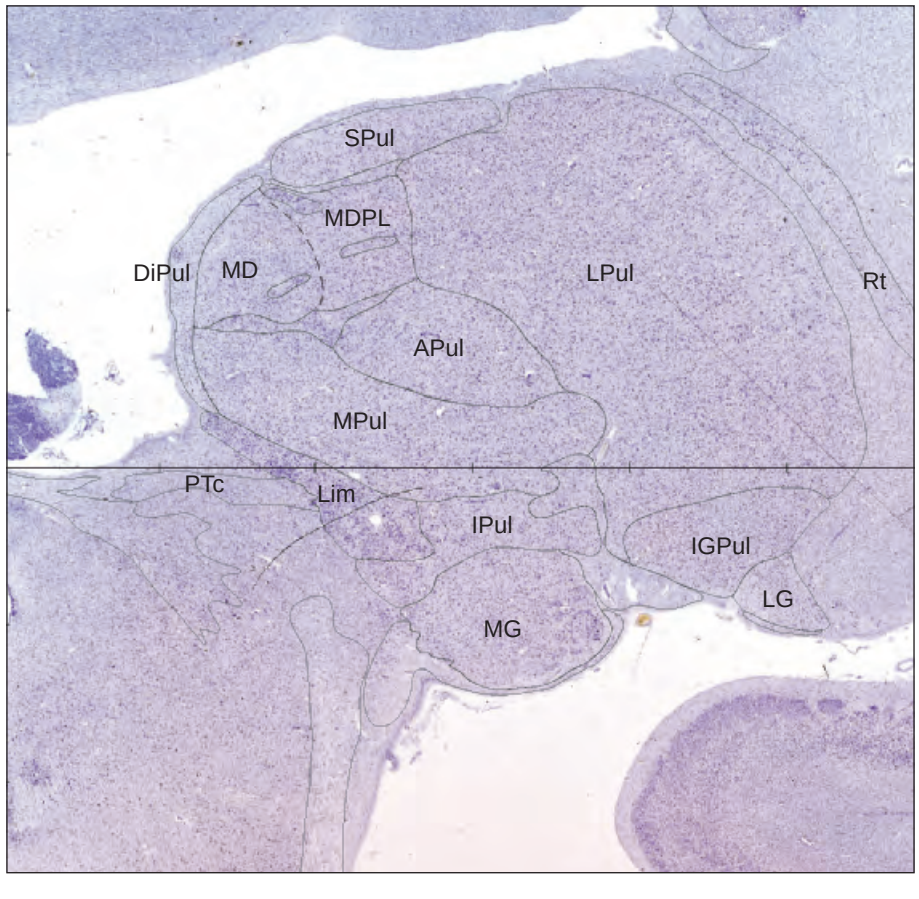
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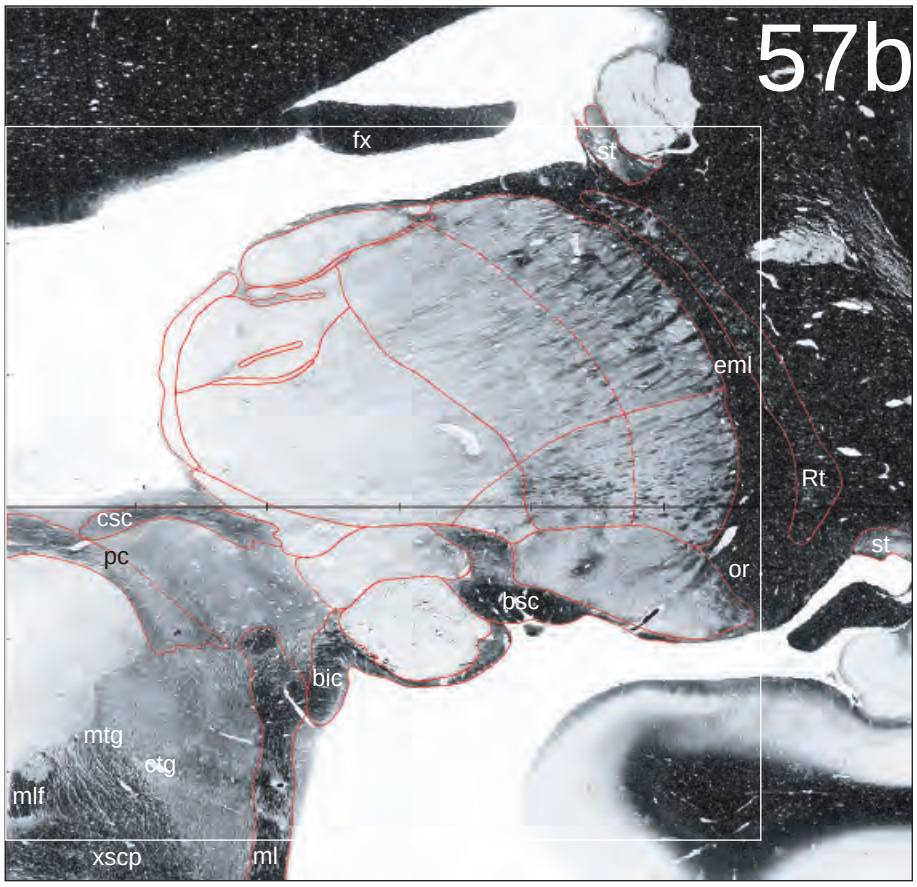
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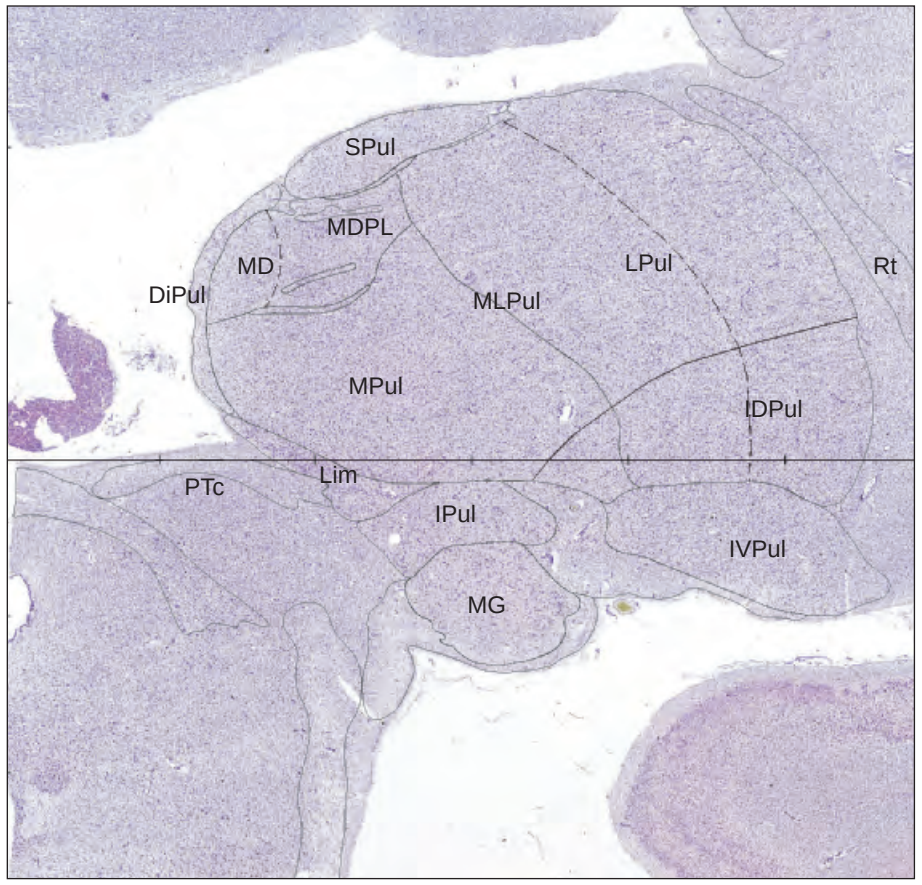
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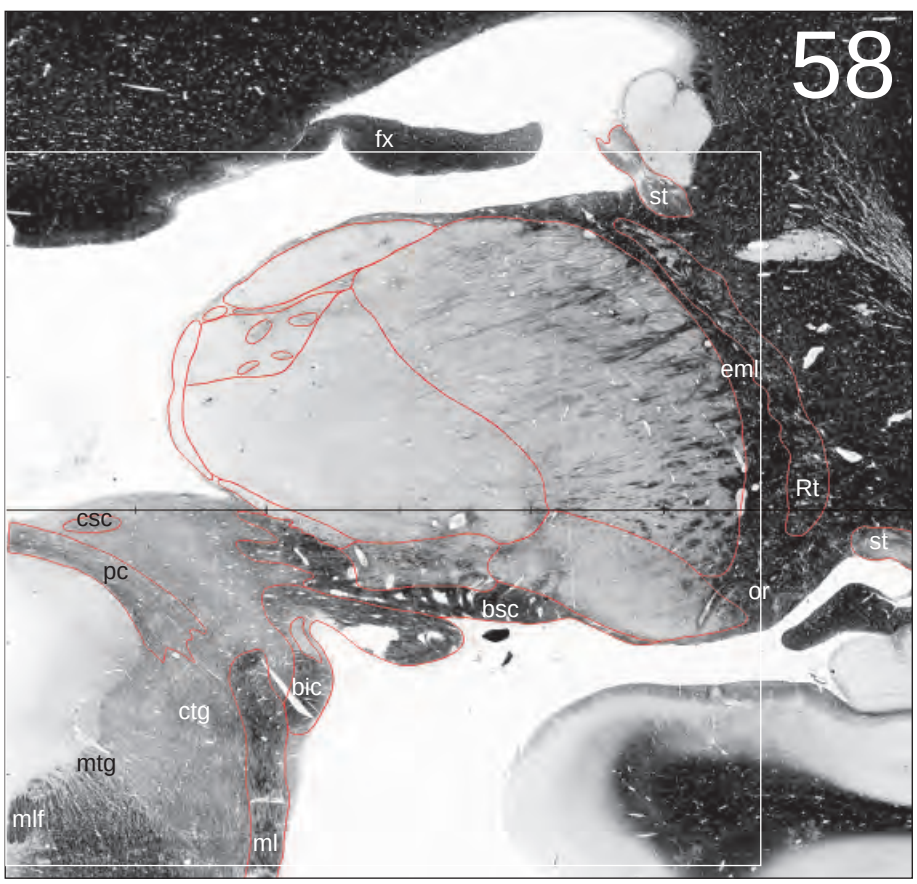
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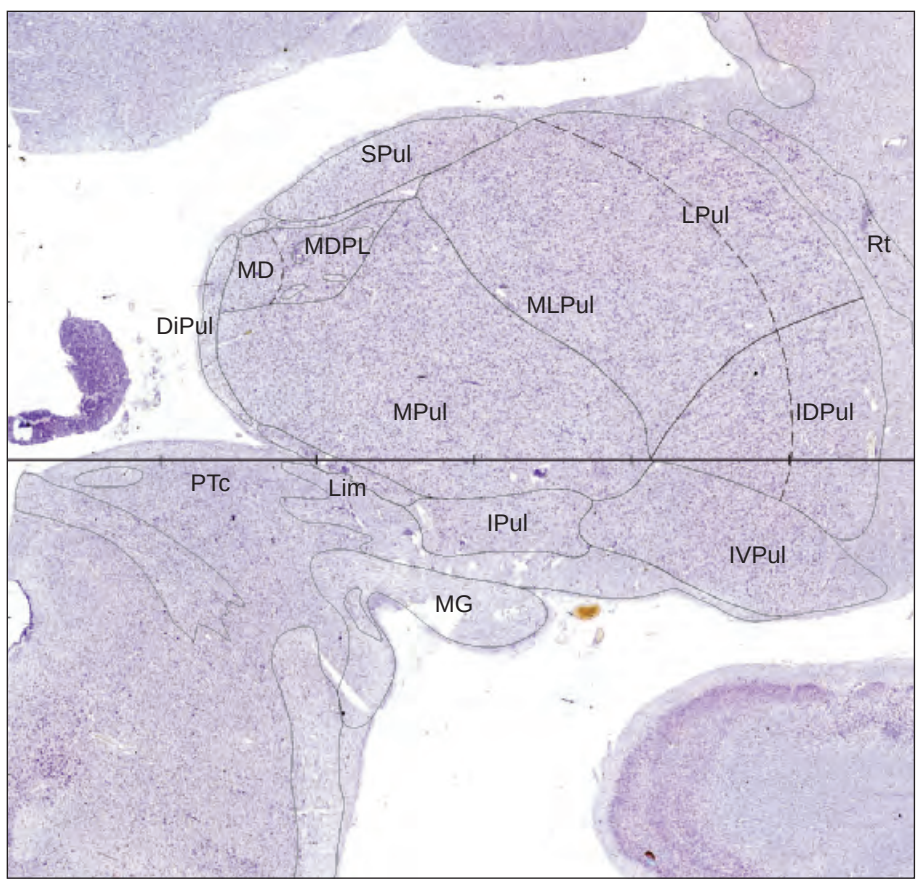
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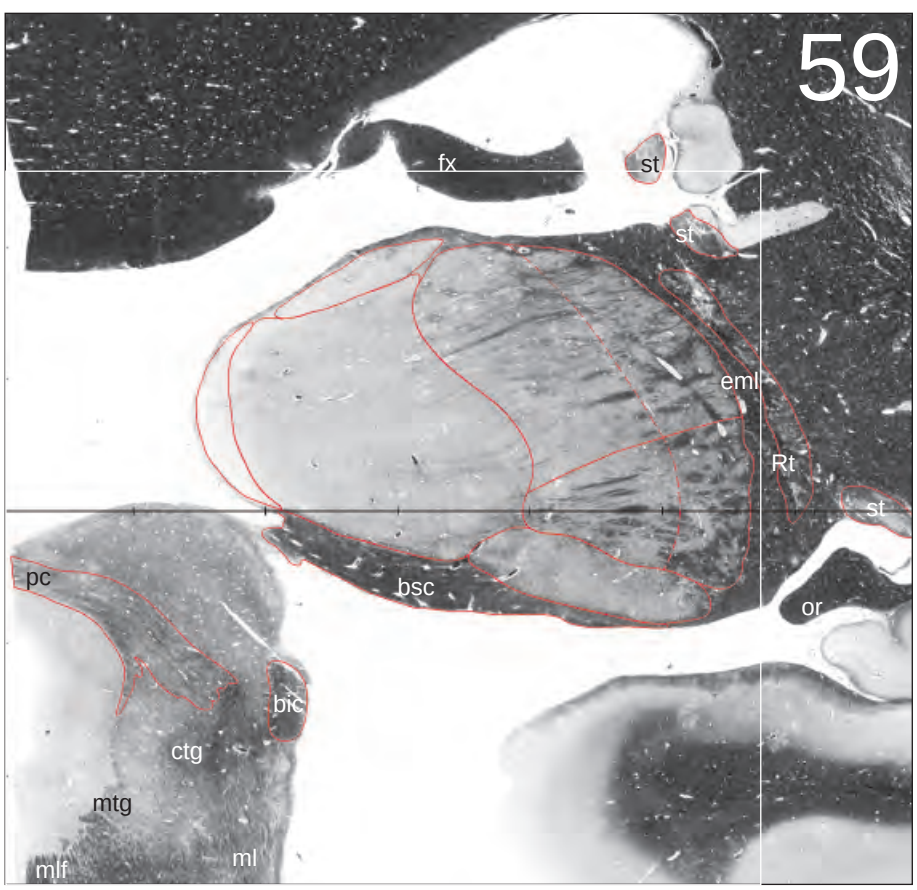
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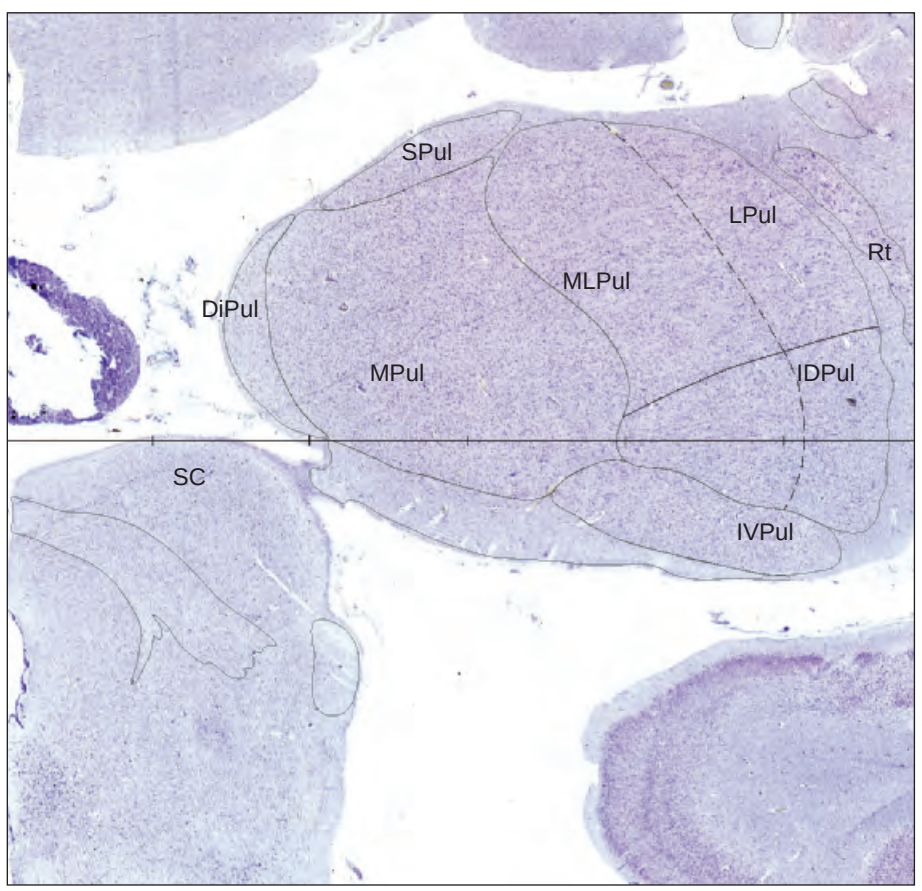
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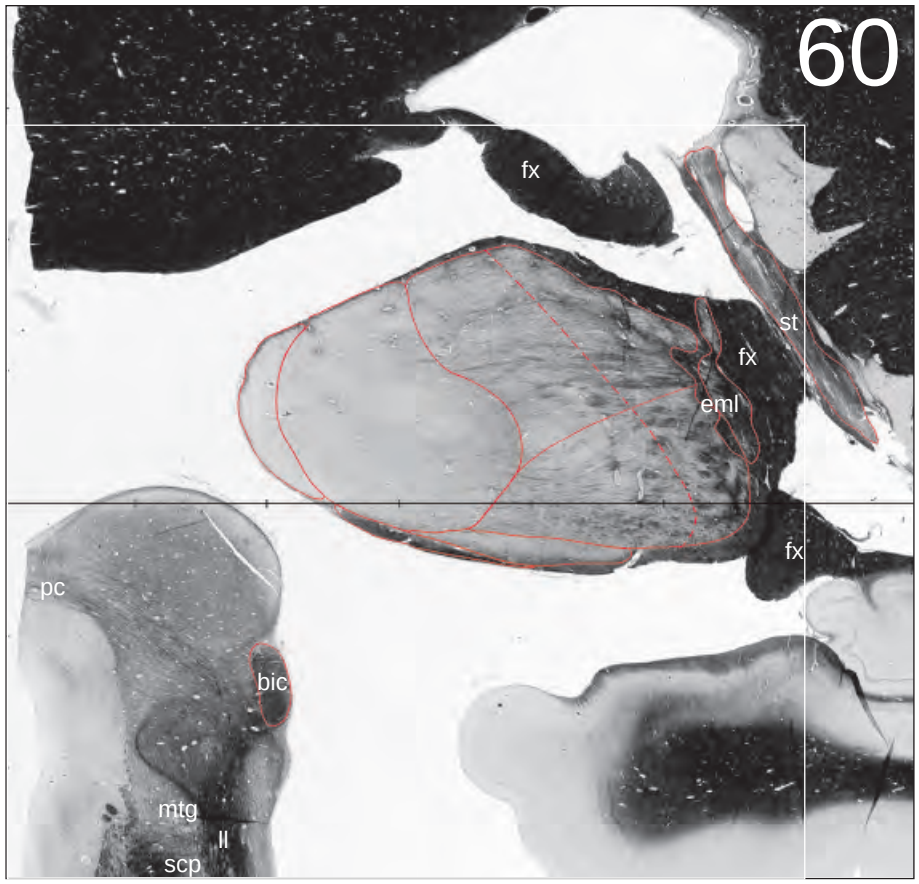
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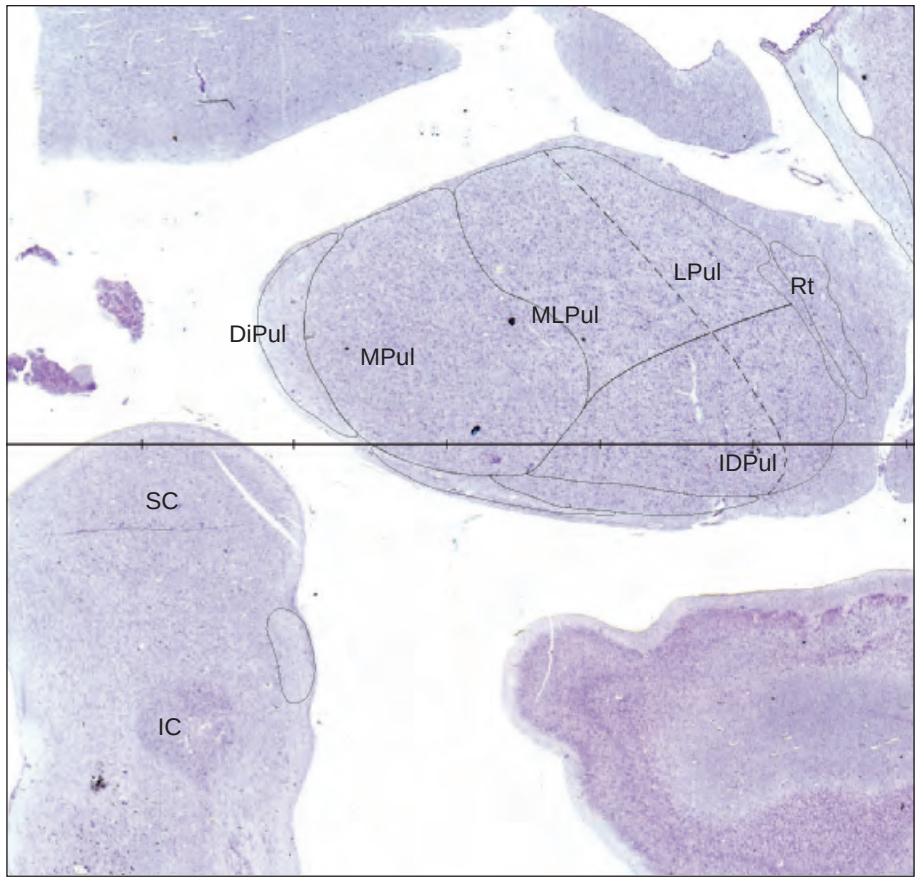
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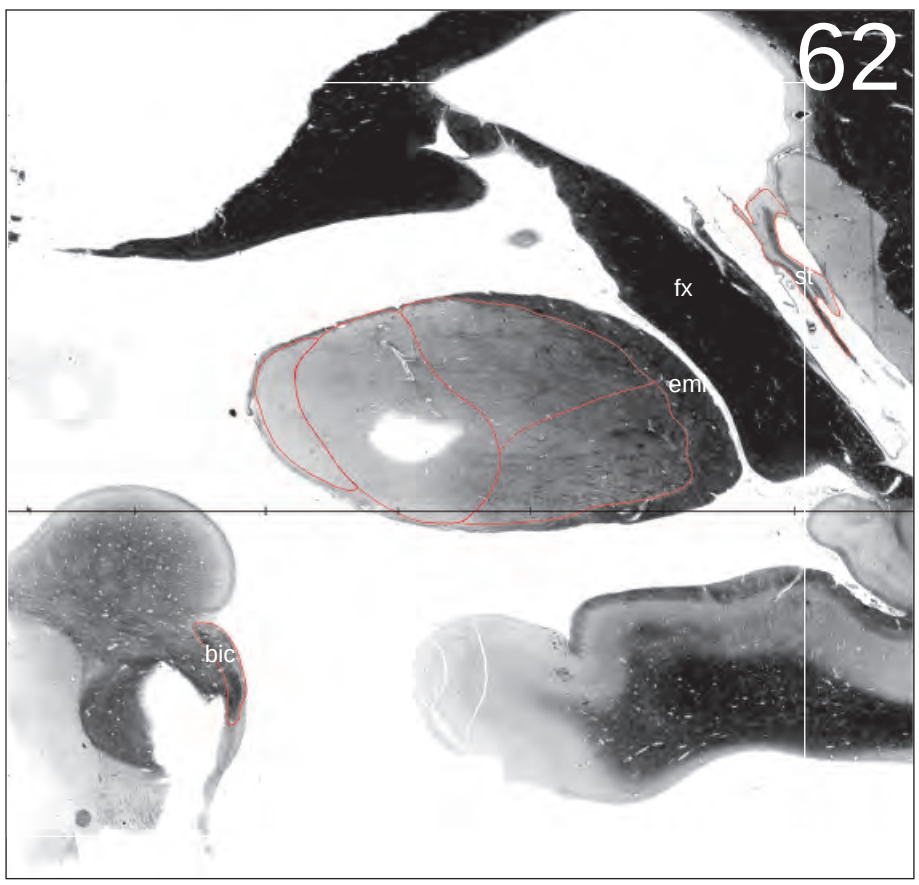
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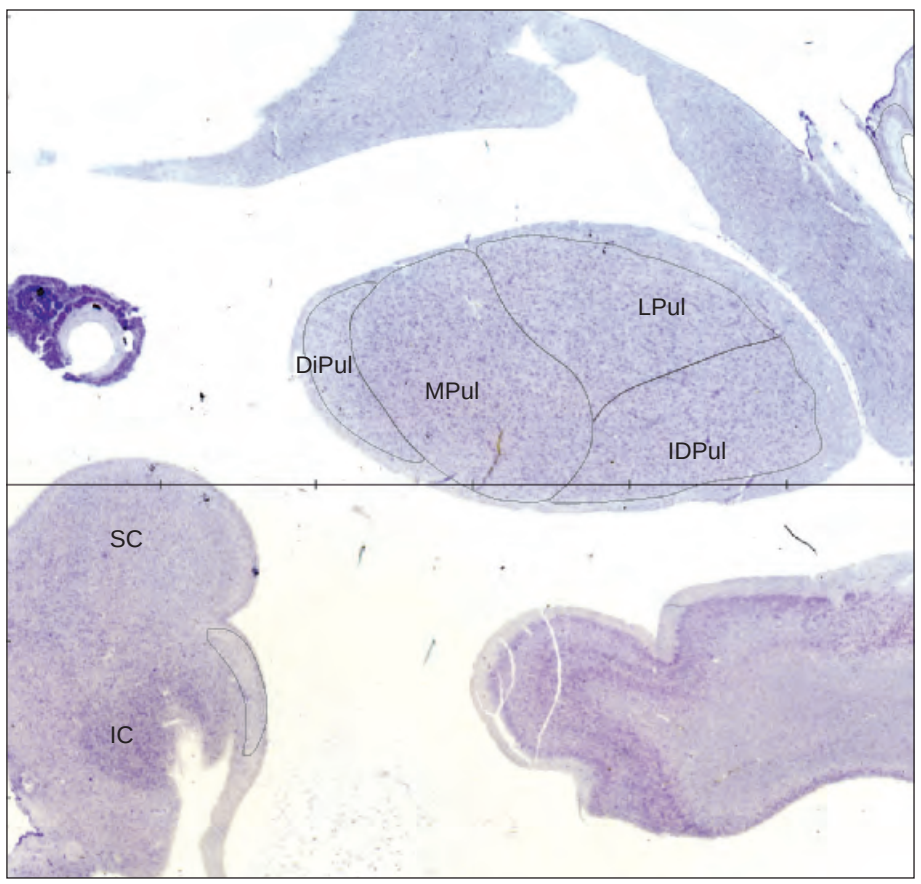

LPul
DiPul
MPul
IDPul
SC
IC

2.5.2 Hypothalamus by Y. Koutcherov

Preoptic Area

Pe periventricular hypothalamic nuclei
- VMPe ventromedial preoptic nucleus
- DPe dorsomedial periventricular nucleus
- AVPe anteroventral periventricular nucleus

MPO medial preoptic nucleus
- MPOL - medial preoptic nucleus, lateral part
- MPOM - medial preoptic nucleus, medial part

IMH intermediate hypothalamic cell groups
- InM intermediate hypothalamic nucleus (SxD)
- Unn uncinate nucleus

AHA Anterior Hypothalamic Area

SCh suprachiasmatic nucleus
- SChC – central, compact division
- SChD - dorsal division

Pa paraventricular hypothalamic nucleus
- PaAP - anterior parvocellular part
- PaD - dorsal part
- PaMC - magnocellular part
- PaPC - parvicellular part
- PaPo - posterior part

SO supraoptic nucleus
- SODL - dorsolateral part
- SOVM - ventromedial part
- SOT - tuberal part
- SOP - posterior part

IHA Infundibular (Tuberal) Hypothalamic Region

VMH ventromedial hypothalamic nucleus
- VMHDM - dorsomedial part
- VMHVL - ventrolateral part
- VMS - shell

DMH dorsomedial hypothalamic nucleus
- DMHD - diffuse part
- DMHC - compact part

Inf infundibular nucleus
- Inf infundibular nucleus

MHA Mammillary Region

MB mammillary body
- SuM supramammillary nucleus
- MM medial mammillary nucleus, medial part
- ML medial mammillary nucleus, lateral part
- LM lateral mammillary nucleus

TM tuberomammillary complex (Brockhaus, 1942)
- TM tuberomammillary nucleus, principal part
- PeF perifornical nucleus

LTu lateral tuberal nucleus
- LTu lateral tuberal nucleus

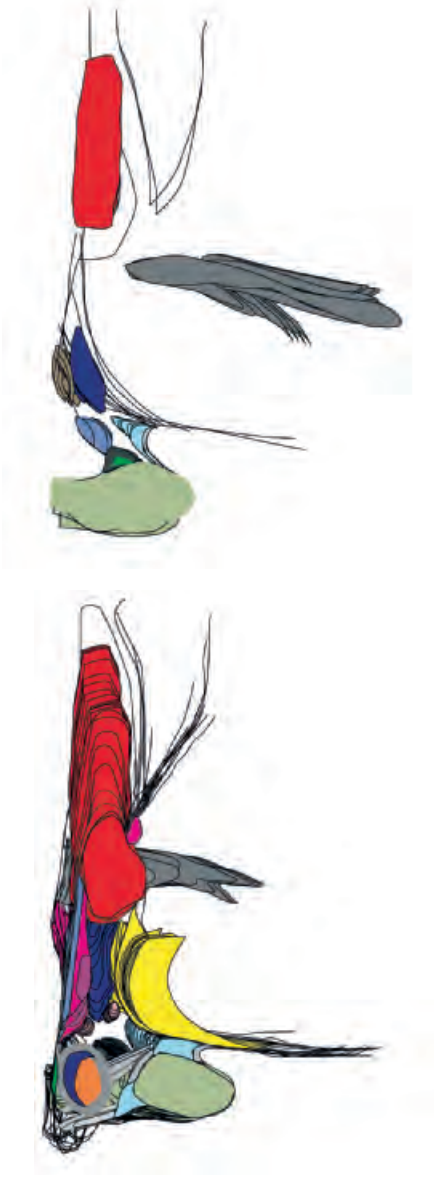
LH Lateral Hypothalamic Area

- LH lateral hypothalamic area, anterior part
- LH lateral hypothalamic area, tuberal part
- LH lateral hypothalamic area, posterior part
- PalHy pallidohypothalamic nucleus

PH Posterior Hypothalamic Area

- PH posterior hypothalamic area

DH Dorsal Hypothalamic Area



Reconstruction of the human hypothalamus. Posterior view of rostrocaudal divisions (from top to bottom: preoptic, anterior, tuberal and mammillary region).

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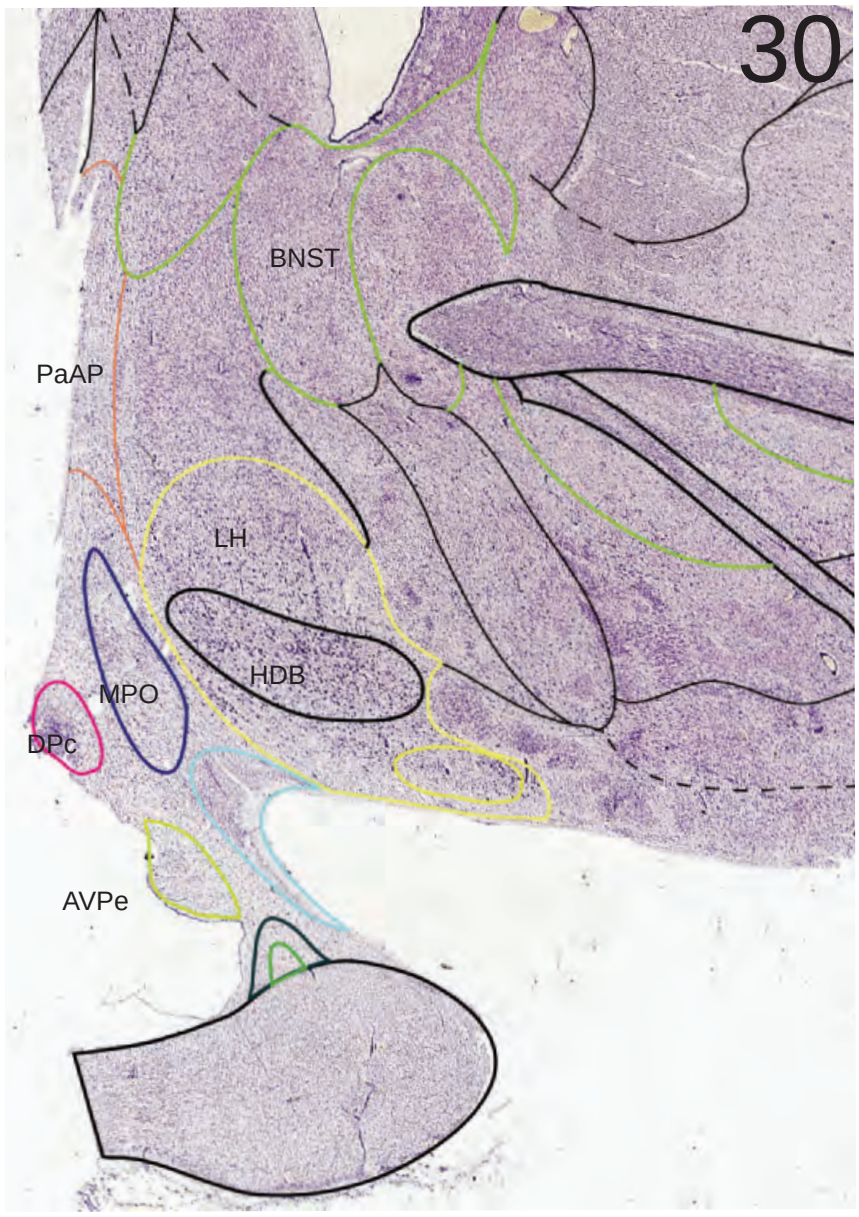
SCh
ox

- 2.7

29
BNST
ADB
SCh
ox

- 2.0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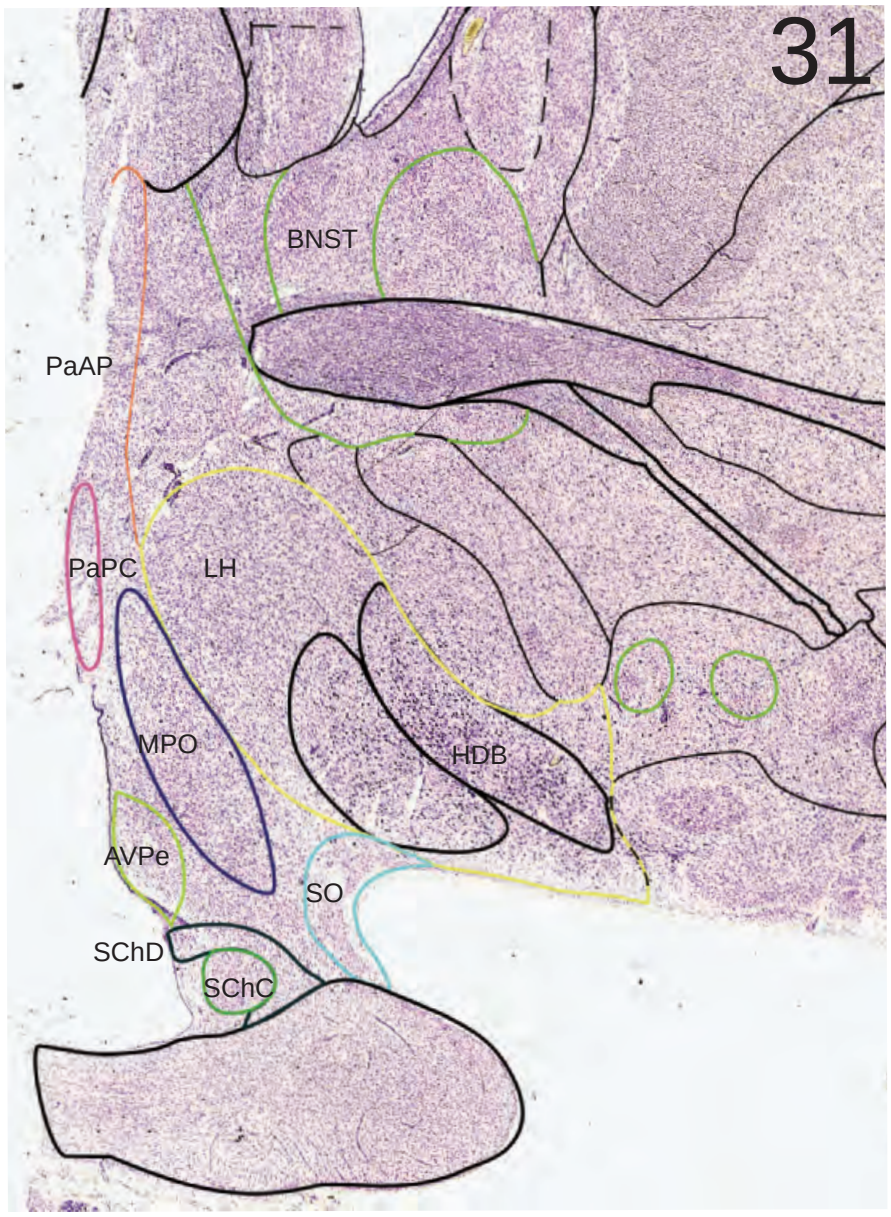
LH
HDB
MPO
DPc
AVPe

- 1.3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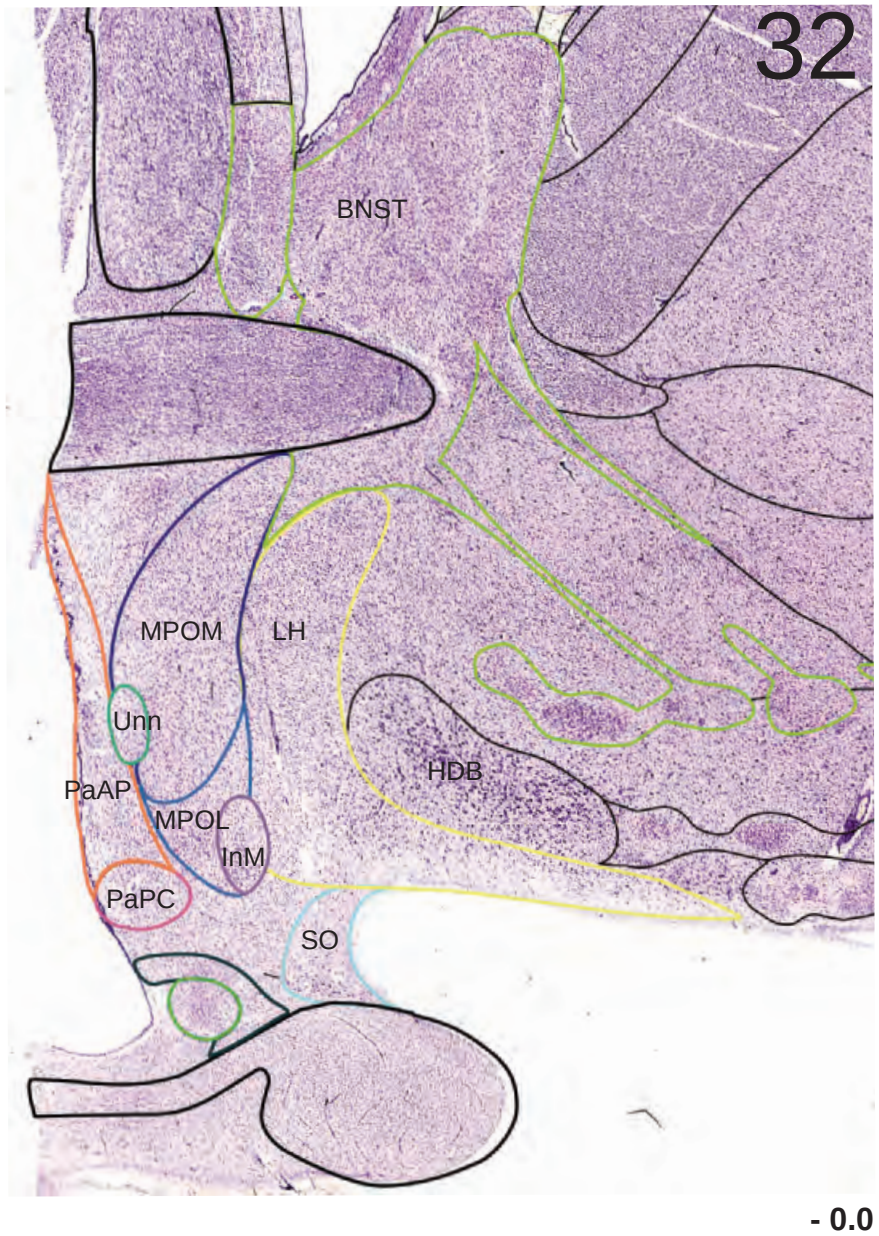
AVPe
SO
SChD
SChC

- 0.6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LH
Unn
PaAP
MPOL
InM
PaPC
HDB
SO

- 0.0

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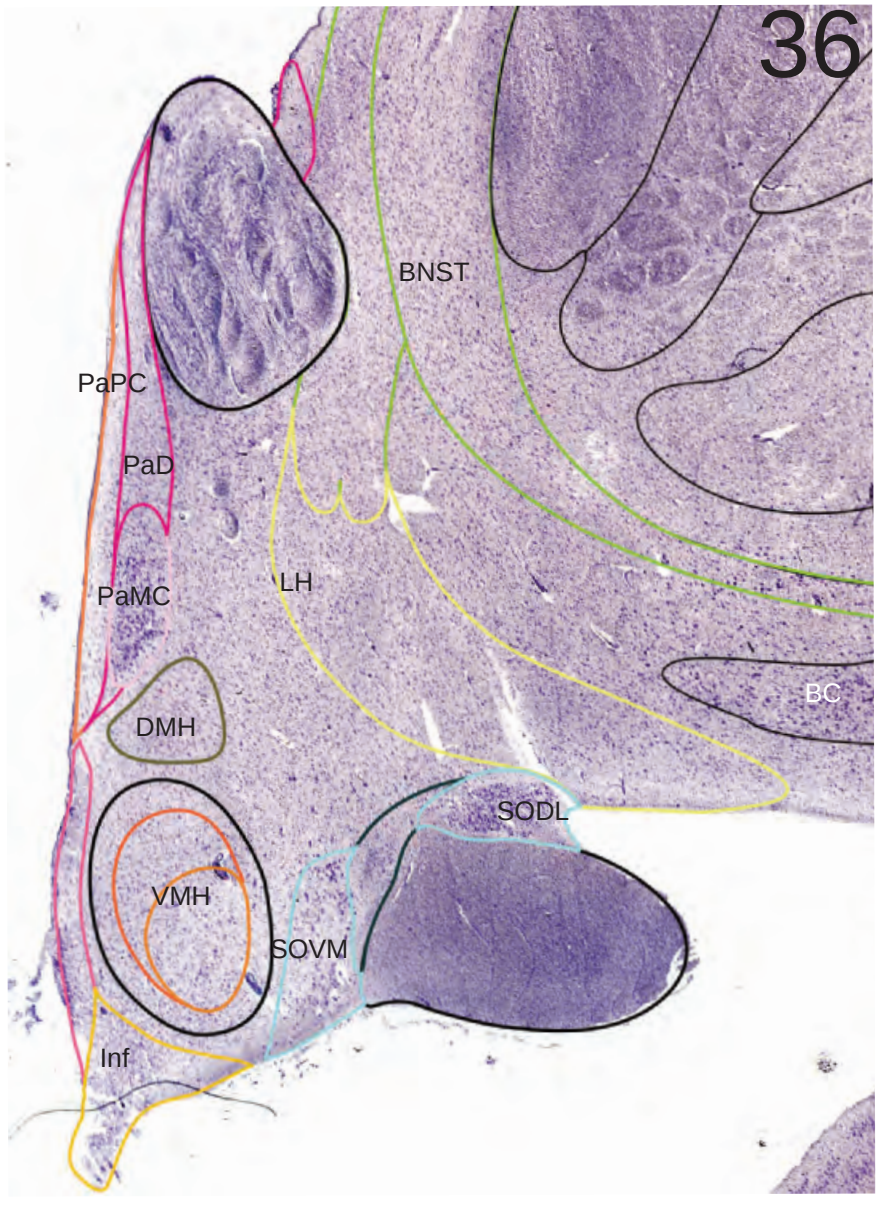
MPOM
PaPC
LH
PaD
PaMC
BC
SCh

+ 1.3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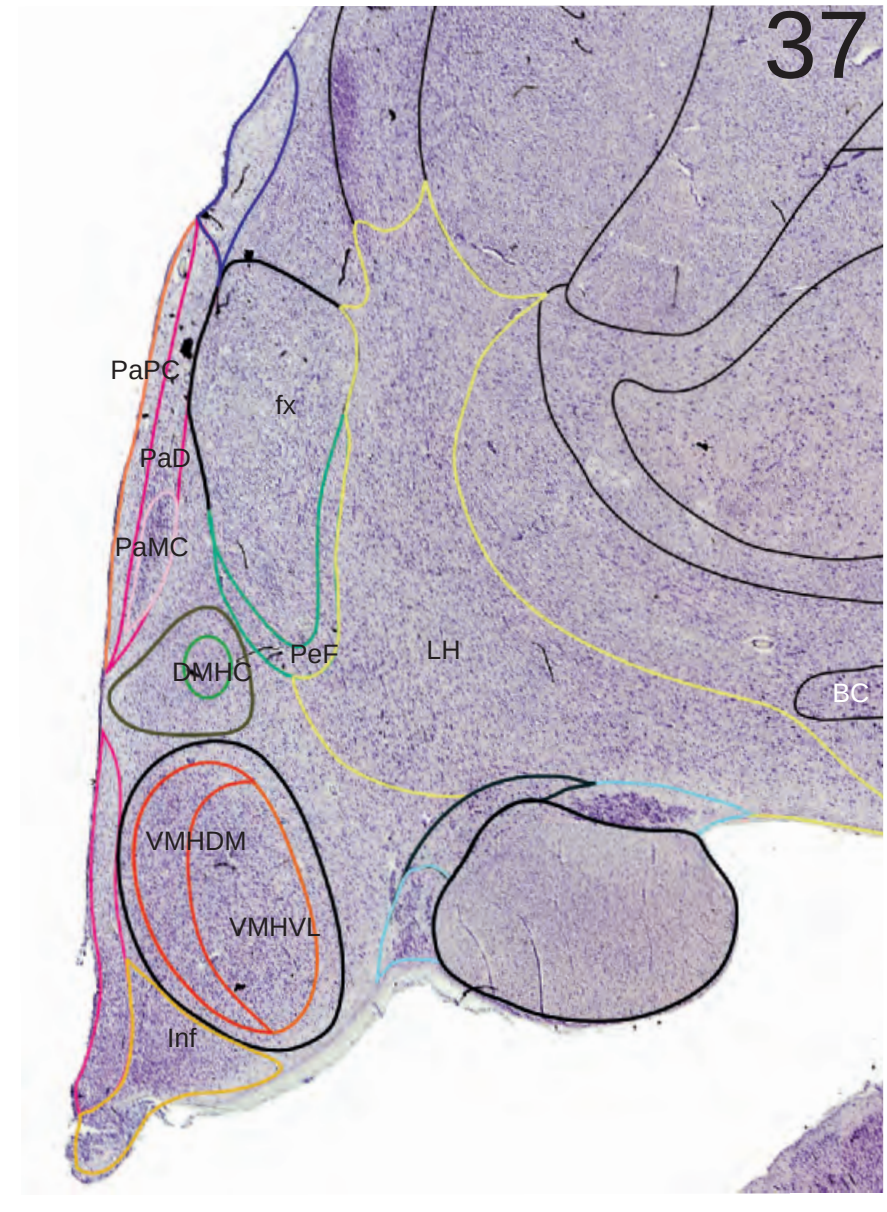
BC
DMH
SODL
VMH
SOVM
Inf

+ 2.7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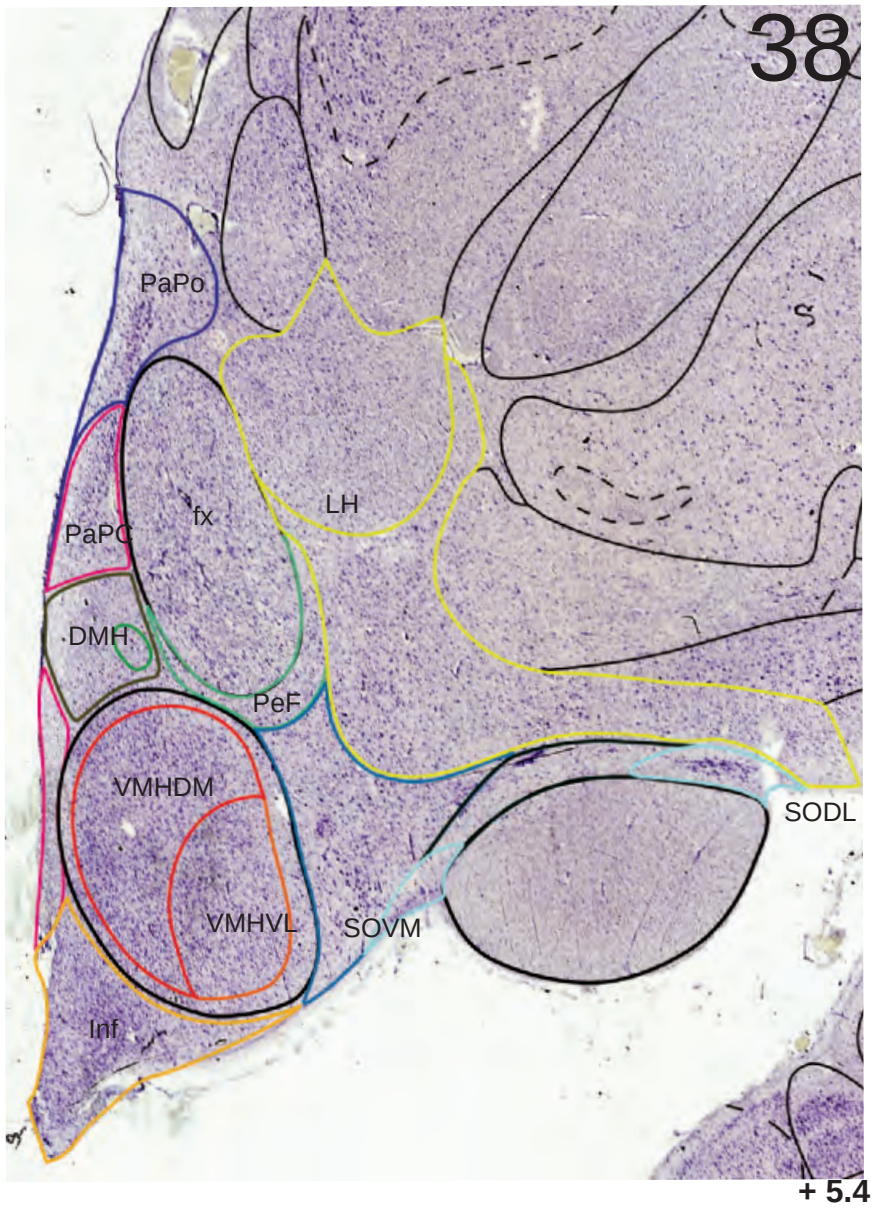
PeF
LH
BC
VMHDM
VMHVL
Inf

+ 4.0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SODL
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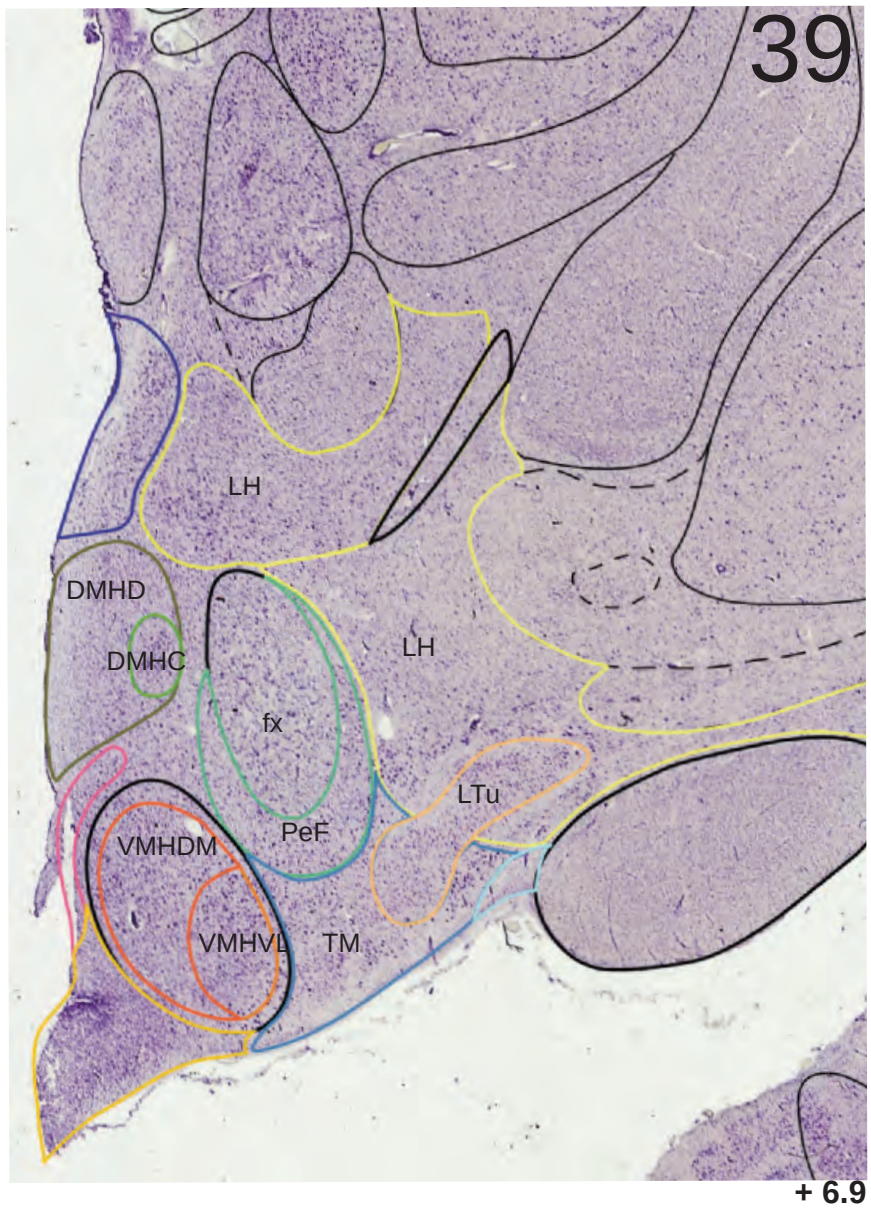
+ 5.4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LH
fx
LTu
PeF
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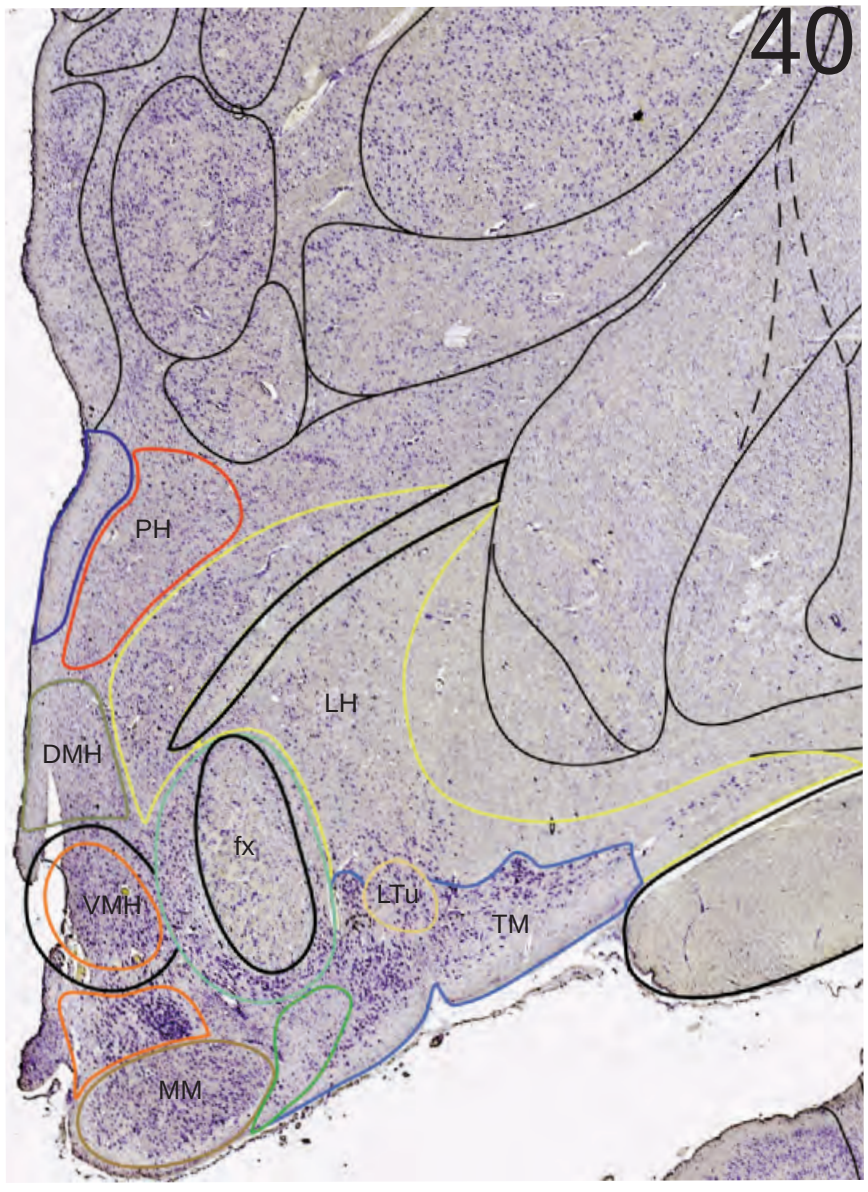
VMHVL
TM

+ 6.9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fx
VMH
LTu
TM
MM

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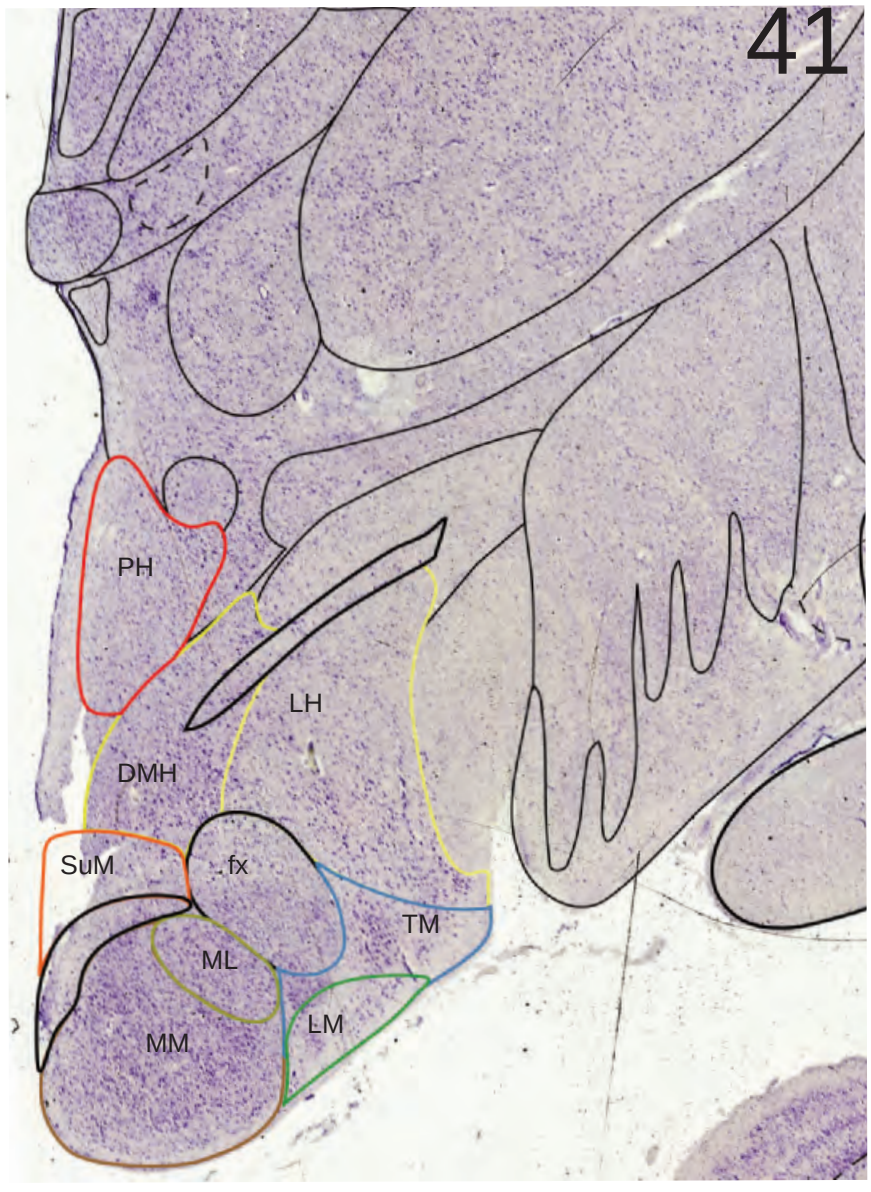
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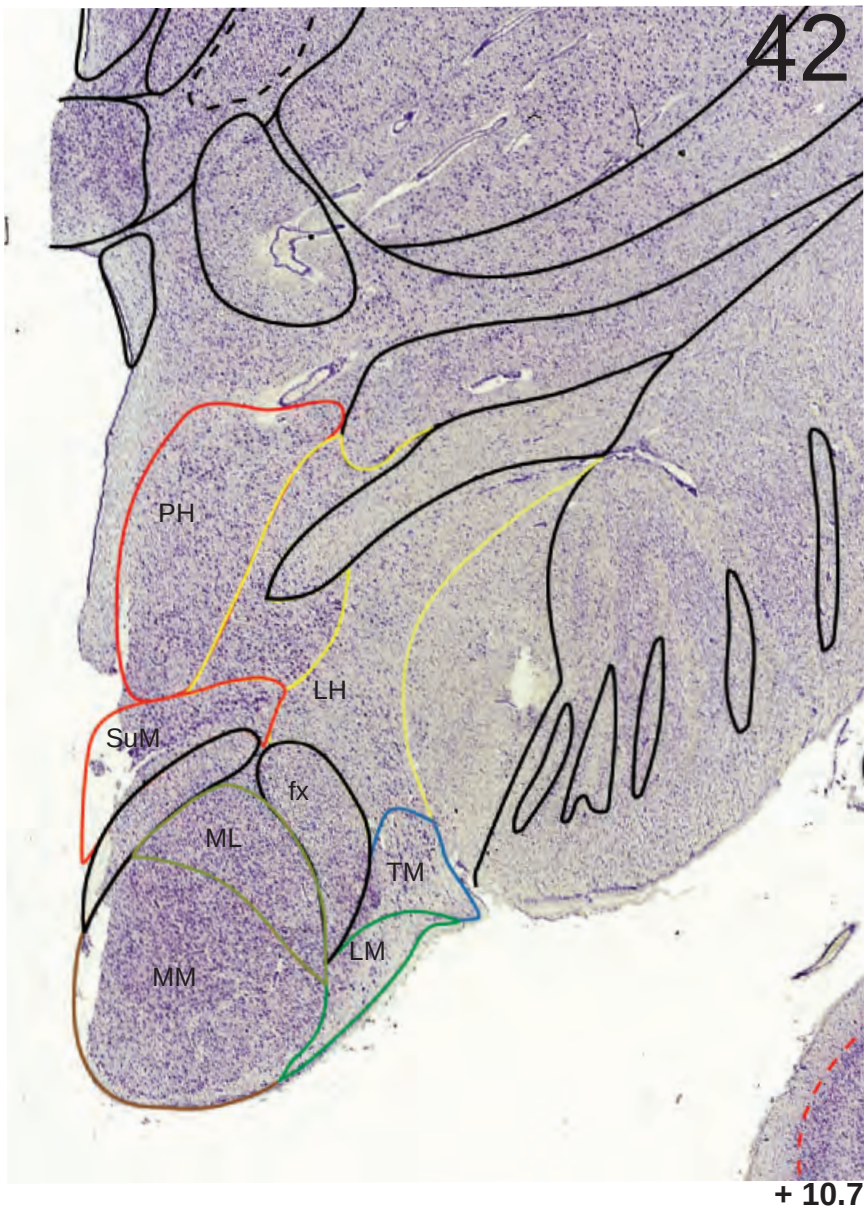
LH
DMH
SuM
fx
TM
ML
LM
MM

+ 9.3



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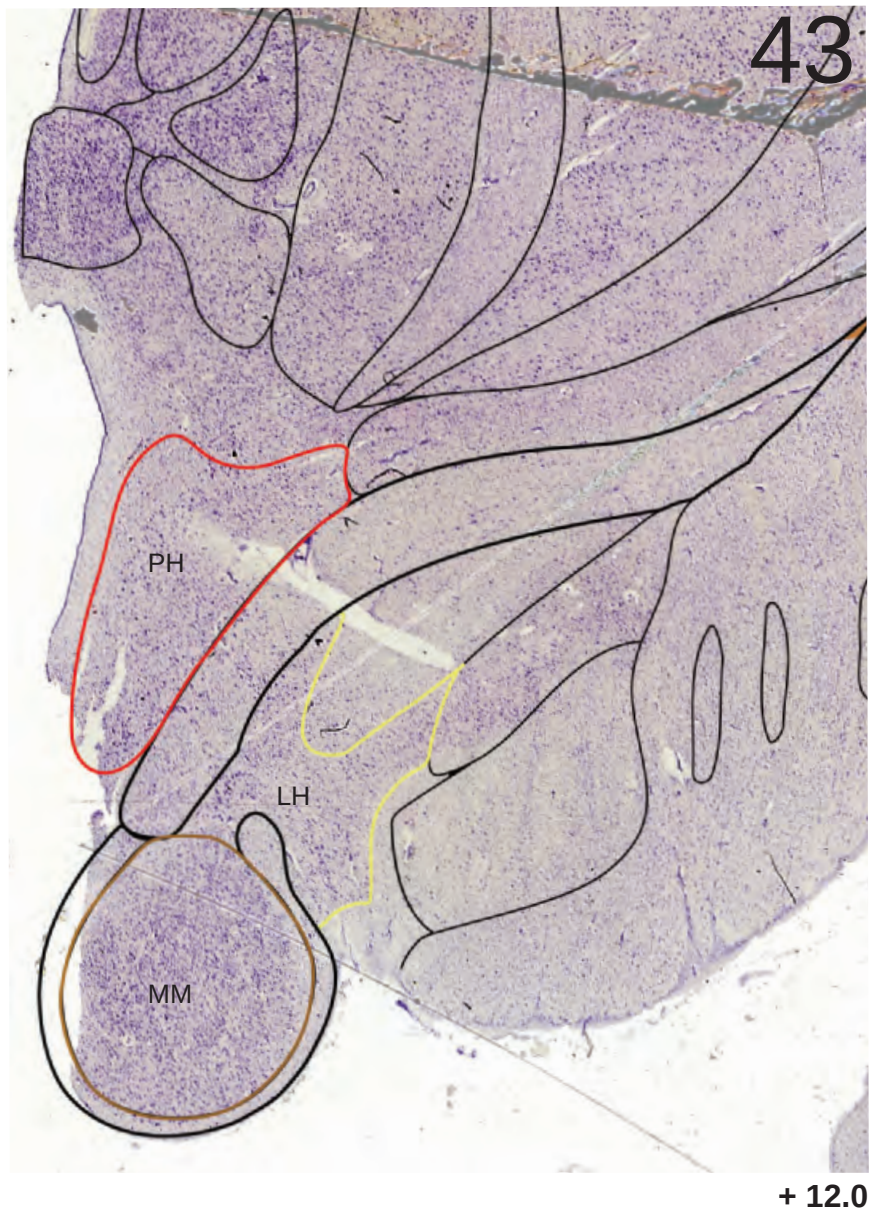

+ 12.0

+ 13.3

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2.6 Published Studies

Referring to the Brain Represented in the Atlas of the Brain in Stereotaxic Coordinates

Numerous descriptive and quantitative studies have been performed on the very same brain represented in the *Atlas of the Brain in Stereotaxic coordinates*. The material on the following pages illustrates that almost all relevant structures and areas of the brain have undergone intensive studies. These include not only detailed morphological and architectural but also morphometric analyses. Relevant published delineations of structures and quantitative data concerning fresh volume, volume of serial sections, numeric cell density, volumetric cell density, absolute cell numbers etc., have been assembled. References pertinent to these data are to be found at the end of this section. Most of the cited literature is available in full, including figures, in an editable format on the website: www.thehumanbrain.info. Therefore, the additional information from the various authors can be counter referenced to the *Atlas*. It is noteworthy that many of such studies were performed in order to quantify morphological changes associated with either neurologic or psychiatric diseases. The 3-D reconstructions shown in this section were derived from *Atlas* sections.

2.6.1 Histological, Morphometric and Histochemical Studies

BRAIN

Weight, Volume and Linear Dimensions

Brain weight (in formalin)	1383
Fresh volume (cm^3)	1316

	R	L
Length (L)*	171	170
Width (W)*	71	71
Height (H)*	97	96
Length +	120	122
Width +	63	64
Height +	82	82

R: right hemisphere, **L**: left hemisphere
* Formalin fixed brain; + after histological preparation

Shrinkage Factors (SF)

	R	L
SFw Lange, Thörner (1974)	2.13	2.22
SFl Lange, Thörner (1974)	1.89	1.81
SFl Sievert (1992)	1.74	1.82

SFw (Weight related shrinkage factor) = [(Bw * 0,88 /1,0365) / serial section volume of hemisphere], where Bw = brain weight, Factor 0,88 = [weight of hemisphere] / [brain weight], Factor 1.0365 = mean specific brain weight).
SF : Loss of volume from the fixed autopsy brains to the histological material.
SFl : Linear calculated volume shrinkage factor = [L*W*H (autopsy brain in formaline)] / [L*W*H (serial paraffin sections)], where L = length of hemisphere; W = width of hemisphere; H = height of hemisphere.

Hopf, A., Gihr, M., Kraus, C. (1967).

PROSENCEPHALON

	R	L
Fresh volume (cm^3)	549	527
Volume of serial sections (cm^3)	267	262

Lange, H., Albring, K.M. (1979); Albring, K.M. (1983); Lange, H., Thörner, G. (1974).

CEREBRAL CORTEX

	R	L
Fresh volume (cm^3)	297	303
Volume of serial sections (cm^3)	144	139

Lange, H., Albring, K.M. (1979); Albring, K.M. (1983); Lange, H., Thörner, G. (1974).

CEREBRAL CORTEX

fresh volume of cortical regions (cm^3)

	R	L
Brain weight (in formalin)	261	277
Isocortex (ICx)		
Isocortex frontalis (ICx.f.)	101	103
ICx.f. convexitatis	63	64
ICx.f. medialis	22	22
ICx.f. opercularis dorsalis	3.6	3.2
ICx.f. opercularis basalis	0.8	1.2
ICx.f. basalis	11	12
Area (A.) gigantocellularis (gc)	5.1	5.5
A. gc. convexitatis	3.8	4.0
A. gc. medialis	1.3	1.5
ICx.parietalis (ICx.pa)	44	42
ICx.pa. convexitatis	24	22
ICx.pa. medialis	16	15
ICx.pa. opercularis	4.9	5.1
Regio postcentralis (R.p)	13	15
R.p. convexitatis	11	12
R.p. medialis	2.1	2.5
ICx. temporalis (ICx.t)	41	49
ICx. t. dorsalis	7.7	7.8
R. temporalis transversalis (R.tv)	2.6	2.2
R.tv.	1.9	1.6
R.tv.2	0.7	0.6
Parieto-temporal convexity	38	38
ICx. occipitalis	37	43
A18 + A19	30	35
A17	7.6	7.9
Allocortex (with Proisocortex)		
Claustro-Cx. temporalis	1.2	0.7
Claustro-Cx. insularis	7.4	7.3
Tbc. olfactorium, R. praepiriformis frontalis, Peri-Palaeo-Cx. frontalis	0.9	0.5
Palaeo-Cx. temporalis	0.5	0.4
Archi-Cx. frontalis	7.3	7.0
Archi-Cx. parietalis	5.6	4.4
Archi-Cx. temporalis	7.3	6.2

Albring, K.M. (1983).

Further studies:

Beheim-Schwarzbach, D. (1952); Braitenberg G. V. (1952); Brockhaus, H. (1940); Busch, K.-T. (1960); Heinze, G. (1954); Sanides, F. (1952); Schulze, H.A (1960).

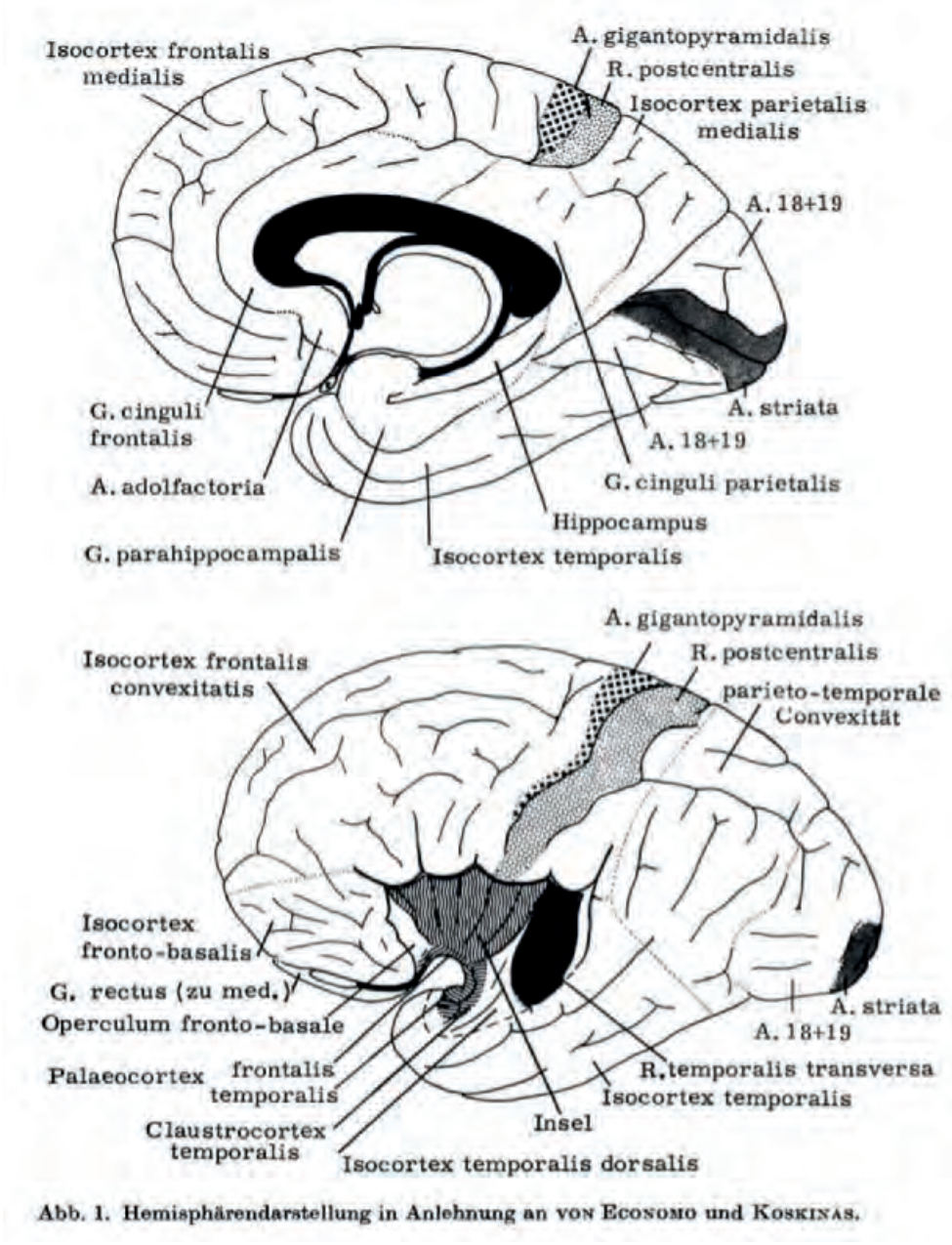


Abb. 1. Hemisphärendarstellung in Anlehnung an von Economo und Koskinas.

Lange, H., Albring, K.M. (1979); Albring, K.M. (1983).

HIPPOCAMPAL FORMATION

Reconstruction of the human hippocampus of the *Atlas* brain. Mai, J.K., Majtanik, M.

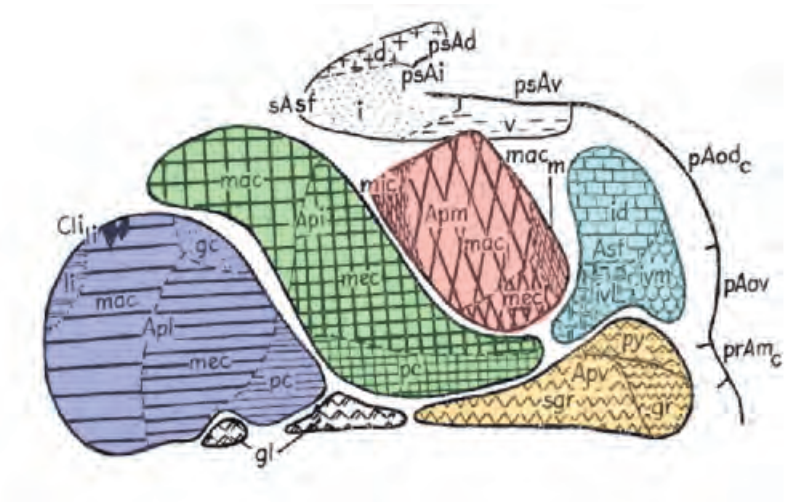
Further study:

Falkai, P (1989).

CLAUSTRUM

Brockhaus, H. (1949).

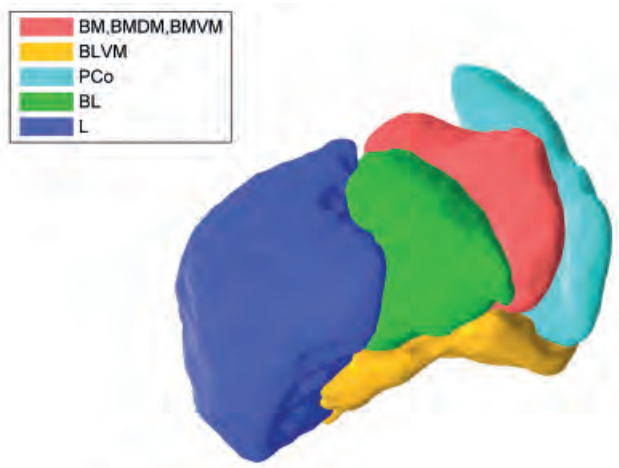
AMYGDALOID COMPLEX



Brockhaus, H. (1938).

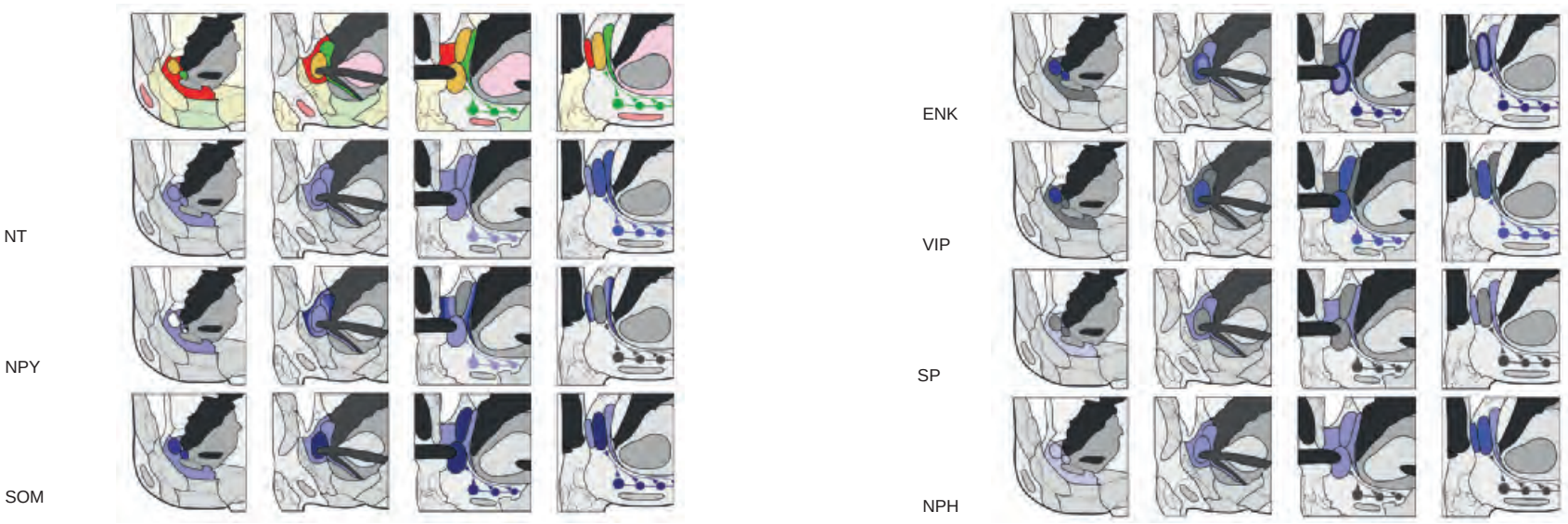
Further study:

Sanides, F. (1957).



Oblque view on the reconstruction of the human amygdaloid complex of the *Atlas* brain. BL: basolateral nucleus; BLVM: basolateral nucleus, ventral part; BM: basomedial nucleus; BMDM: basomedial nucleus, dorsomedial part; BMVM: basomedial nucleus, ventromedial part; L: lateral nucleus; BL: basolateral nucleus; PCo: posterior cortical nucleus. Mai, J.K., Majtanik, M. (2014).

SEPTAL NUCLEI AND BED NUCLEUS OF STRIA TERMINALIS



Subareas of the bed nucleus of the stria terminalis as distinguished by immunoreactivity for different neuropeptides (NT: neurotensin, NPY: neuropeptide Y; SOM: somatostatin; ENK: L- and M-enkephalin; VIP: Vasoactive intestinal polypeptide; SP: Substance P; NPH Neurophysin I,II. (modified from: Walter, A., Mai, J.K., Lanta, L., Görcs, T., 1991).

Further study:

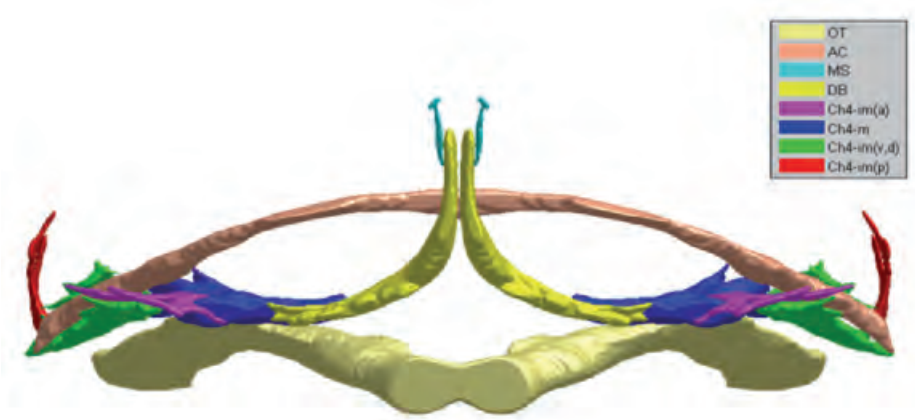
Brockhaus, H. (1942).

BASAL NUCLEAR COMPLEX

Brockhaus, H. (1942): Schema of the human basal nuclear complex.

Further studies:

Buttlar-Brentano, K.v. (1954,1955,1956); Morres S. A., Mai J. K., Teckhaus L. (1992).



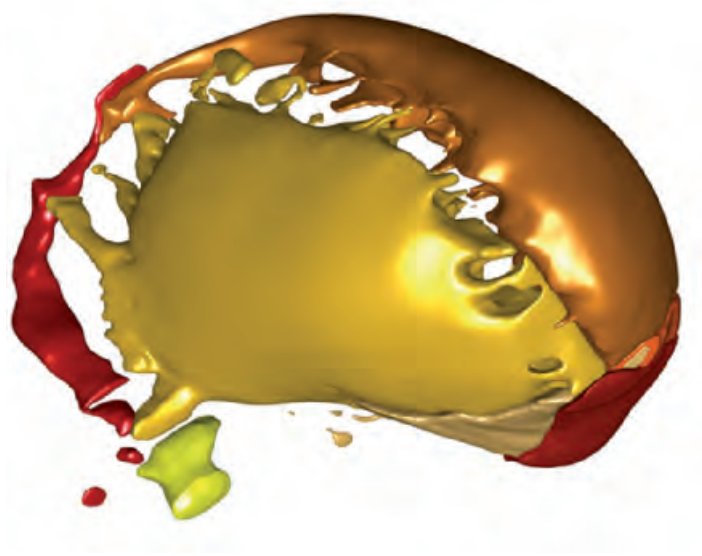
Reconstruction of the human basal nuclear complex of the *Atlas* brain together with the anterior commissure (orange) and optic chiasma and tract (yellow). MS: medial septal nucleus; DB: diagonal nucleus; Ch4: basal nucleus of Meynert. Original data from Morres et al., 1992. Mai, J.K., Majtanik, M. (2014).

BASAL GANGLIA

STRIATUM

	R	L
Volume of serial sections (10 mm³)		
Caudate nucleus	298	269
Putamen	360	343
Numeric cell density (number / mm³)		
Small neurons (x10)	2029	2248
Large neurons	156	156
Glial cells (x10)	7360	7835
Volumetric neuronal density (10^{-2} %)	454	393
Nuclear diameter (10^{-2} µm)		
Small neurons	859	891

Albring, K.M. (1983); Lange, H., Albring, K.M. (1979); Lange, H., Thörner, G. (1974); Lange, H., Thörner G., Hopf, A. (1975a,b; 1976); Lange, H., Thörner, G., Hopf, A., Schröder, K.F.(1976).



Oblique anterior view of the human striatum. Mai, J.K., Majtanik, M. (2014).

CAUDATE NUCLEUS

Numeric cell density (number / mm³)	
Macroneurons (L)	270
Microneurons (S)	22,663
L/S	1/83
Average diameter in µm	10.78

PUTAMEN

Numeric cell density (number / mm³)	
Macroneurons (L)	163
Microneurons (S)	19,953
L/S	1/119
Average diameter in µm	9.47

Dom. R. (1976); Dom, R., De Saedeleer, J., Bogerts, B., Hopf, A. (1981).

Further studies:

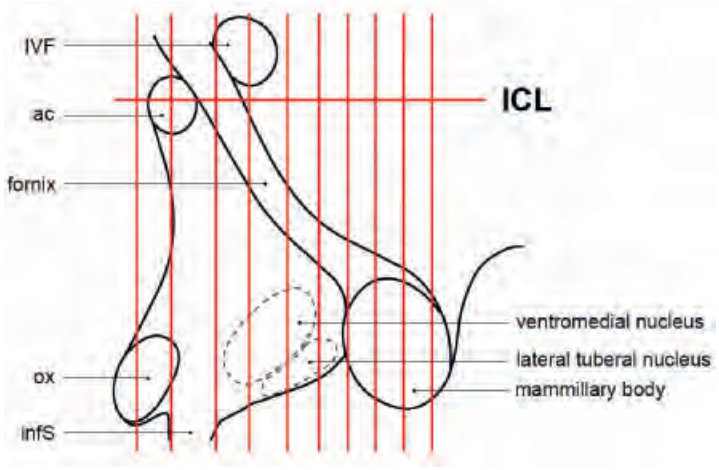
Brockhaus, H. (1942); Namba, M. (1957); Sanides, F. (1957).

GLOBUS PALLIDUS

		R	L
Volume of serial sections (mm³)			
External globus pallidus	EGP	656	560
Internal globus pallidus	IGP	289	238
Numeric cell density (number / mm³)			
Neurons	EGP	763	994
	IGP	625	588
Glial cells (*10^3)	EGP	124	132
	IGP	118	120
Volumetric cell density (10^{-3} %)			
Neurons	EGP	290	380
	IGP	210	270
Glial cells	EGP	450	620
	IGP	510	580

Lange, H., Albring, K.M. (1979).

HYPOTHALAMUS



Wahren, W. (1952), modified. The diagram shows the positions of the sections of the left hemisphere of the *Atlas* brain as delineated by W. Wahren in Schaltenbrand G. and Wahren, W.: Atlas for Stereotaxy of the Human Brain. IInd ed. G. Thieme, Stuttgart (1977).

Further studies:

Brockhaus, H. (1942); Buttlar-Brentano, K.v. (1954); Mai, J.K., Kedziora, O., Teckhaus, L. & M.V. Sofroniew (1991). 3-D reconstructions of individual hypothalamic nuclei also based on the Atlas brain have been published Koutcherov, I.et al., (2000; 2004; 2007).

Reconstruction of the human hypothalamus (posterior-anterior view). Koutcherov, Y. (2008); Mai J.K., Majtanik, M. (2014).

THALAMUS

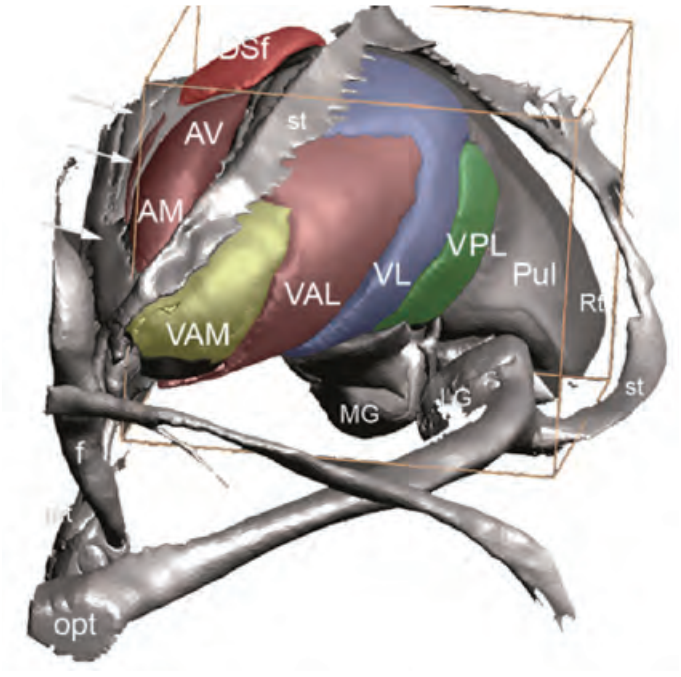
Numeric cell density (number / mm³)

Small neurons	anterior thalamus	3,522
	medial thalamus	4,544
	lateral thalamus	1,012
	posterior thalamus	4,686
Large neurons	anterior thalamus	6,177
	medial thalamus	5,538
	lateral thalamus	3,248
	posterior thalamus	7,618

Dom, R. et al.(1981); Dom. R. (1976).

Further studies:

anterior ncl.: Fünfgeld, E.W. (1952, 1954)
mediodorsal ncl.: Bäumer, H. (1952); Namba, M. (1958)
lateral ncl.: Bäumer, H. (1952,1954); Dom, R. (1976).



Reconstruction of the human thalamus of the *Atlas* brain. Am, AV,DSF: anterior group nuclei; VAM, VAL, VL, VPL: lateral nuclei; LG, MG geniculate nuclei; Pul: pulvinar; opt: optic chiasma and tract; st; stria terminalis. Mai, J.K., Forutan, F. (2013).

SUBTHALAMUS

SUBTHALAMIC NUCLEUS

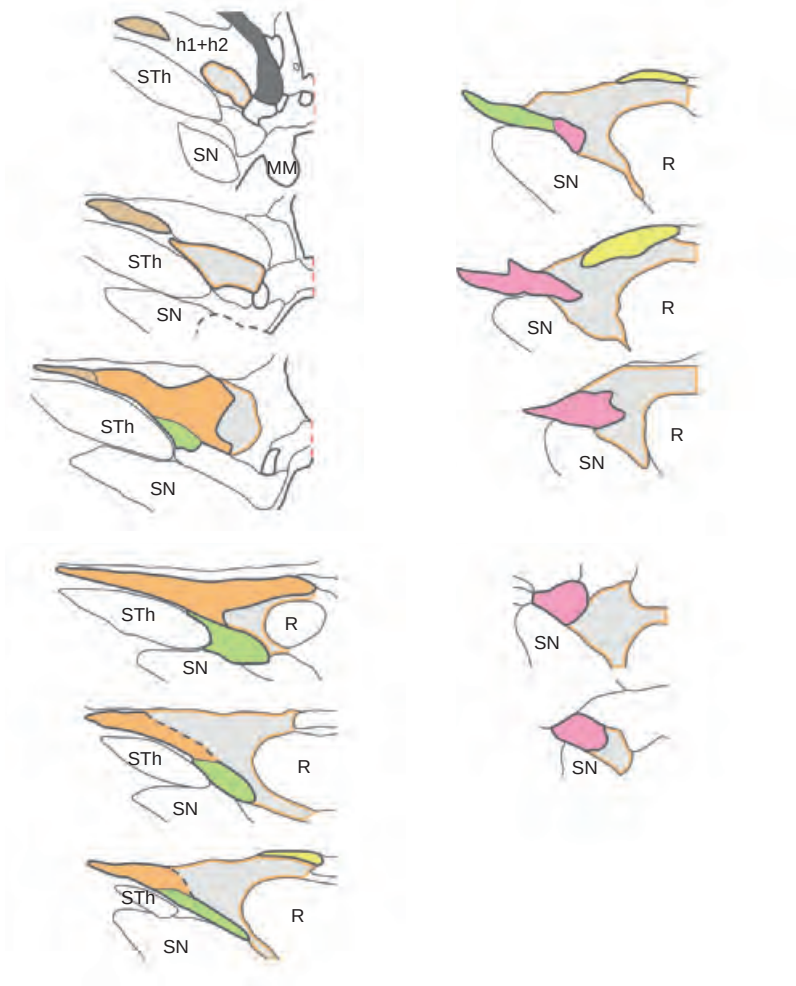
		R	L
Fresh volume (cm³)		0.139	0.119
Volumes of serial sections (mm³)			
Subthalamic ncl., med. part	SThM	31.7	31.2
	SThL	35.7	26.6
	total	67.4	57.9
Numeric cell density (number / mm³)			
Neurons (*10)	SThL	375	357
	SThM	591	516
Volumetric cell density			
Neurons (10^{-2} %)	SThL	142	199
	SThM	162	223
Volumetric cell density (%)			
Neurons:	SThL	2.48	
	SThM	1.87	
Glia	SThL	0.99	
	SThM	0.923	
Numeric cell density (number / mm³)			
	SThL	7,417	
	SThM	8,046	
Absolute cell numbers		232	700
		287	600

Füssenich, M.S.U. (1967).

Further studies:

Brockhaus, H. (1942); Klatzo, I. (1954); Lange, H., Thörner, G. (1974); Lange, H., Thörner G., Hopf, A. (1975a,b; 1976); Lange, H., Thörner, G., Hopf, A., Schröder, K.F. (1976); Marani, E., Tjitske, H., Lakke, E.A.J.F., Usunoff K.G. (2008).

Zona incerta



N. zonae incertae dorsooralis
N. zonae incertae dorsocaudalis
N. zonae incertae ventralis
N. zonae incertae praerubralis
N. zonae incertae caudalis

Brockhaus, H. (1942, modified): Delineations derived from the left hemisphere (L4) of the *Atlas* brain. Abbrev.: h1+h2: thalamic and lenticular fascicles; R: red nucleus; SN: substantia nigra; STh: subthalamic nucleus.

MESENCEPHALON

RED NUCLEUS

Volumes of serial sections (mm^3)

Dorsomedial quadrant	r1	26.6
Dorsolateral quadrant	r2	35.9
ventrolateral quadrant	r3	35.8
ventromedial quadrant	r4	35.2

Numeric cell density (number/mm^3)

		R	L
Neurons	r1	171	172
	r2	124	95
	r3	104	103
	r4	104	104
Glial cells	r1	446	421
	r2	384	336
	r3	320	402
	r4	309	308

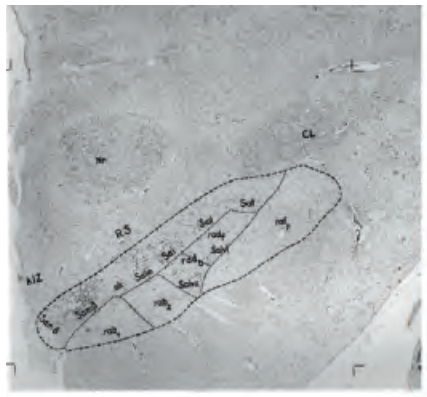
Volumetric density (%)

Neurons	r1	57	51
	r2	28	24
	r3	25	27
	r4	21	23
Glial cells	r1	78	69
	r2	74	58
	r3	74	60
	r4	72	56

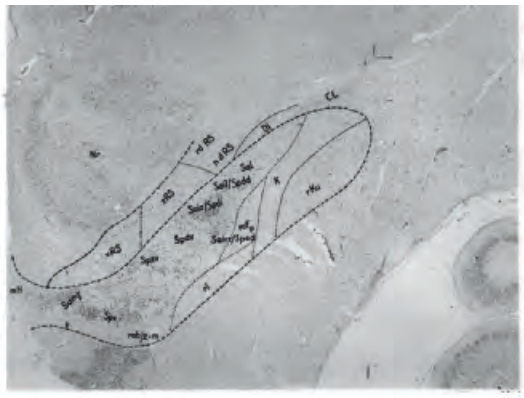
values without shrinkage factor-correction

Herbel, W. (1979); Sander, H.A. (1981).

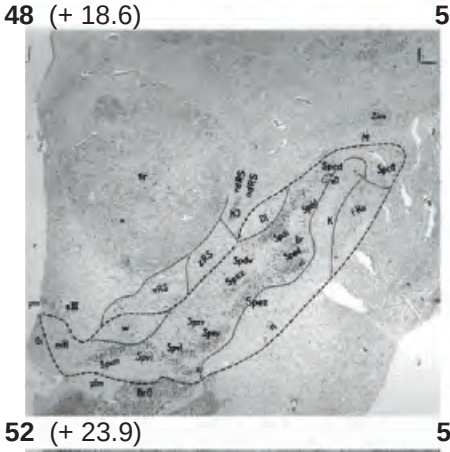
SUBSTANTIA NIGRA



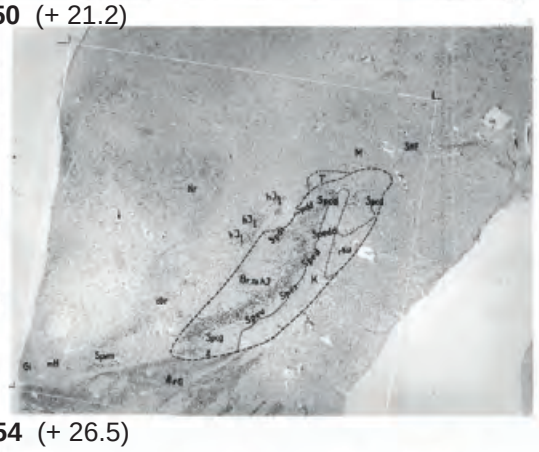
48 (+ 18.6)



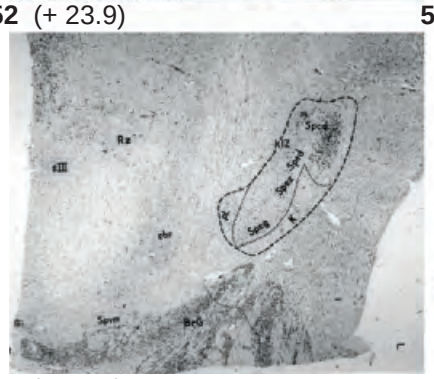
50 (+ 21.2)



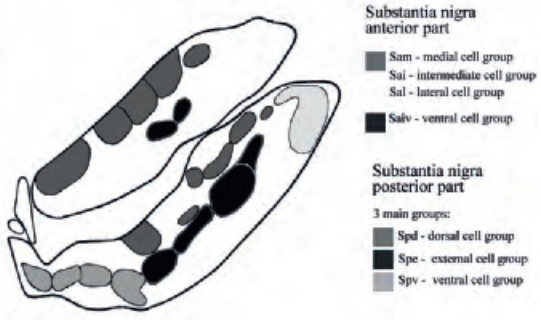
52 (+ 23.9)



54 (+ 26.5)



55 (+ 27.8)



Hassler (1937, 1938).

Further studies:
Bogerts, B., Häntsch, J., Herzer, M. (1982); Solcher, H. (1956).

LOWER BRAINSTEM

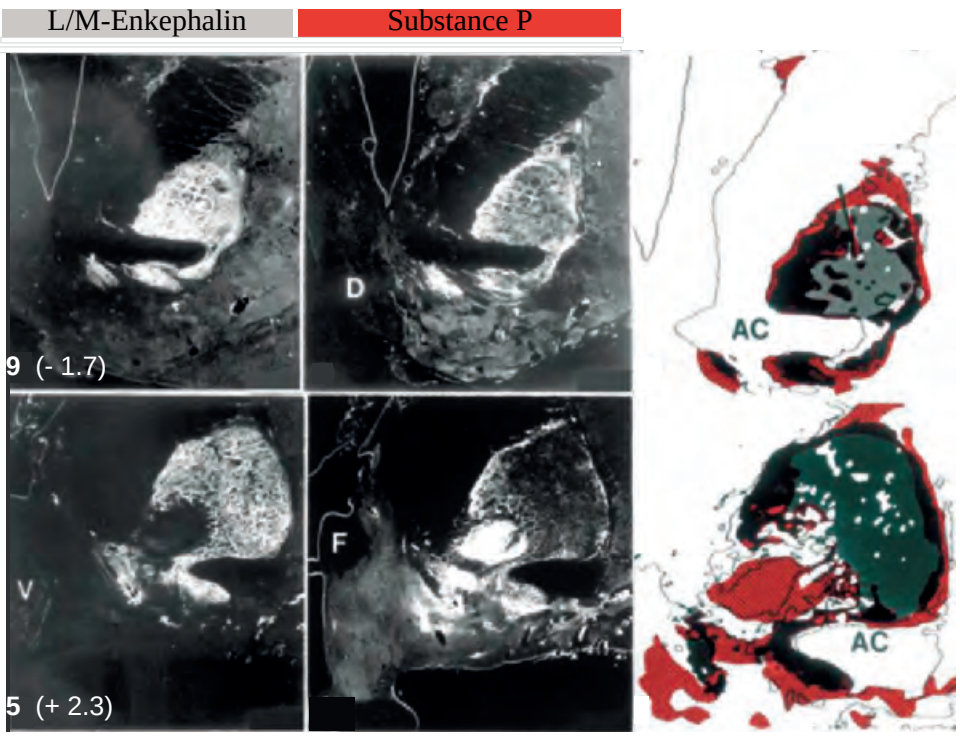
Locus coeruleus: Wünscher, W. (1956);
Superior olive: Beheim-Schwarzbach, D. (1955); Wünscher, W. (1956).

CELL STUDIES

Hempel, K.-J., Treff, W.M. (1959); Klatzo, I. (1954); Schiffer, D.(1954); Treff, W.M., Hempel, K.-J. (1959).

NEUROACTIVE SUBSTANCES

Mai, J.K., Kedziora, O., Teckhaus, L., Sofroniew M.V. (1991); Mai, J.K., Stephens, P., A. Hopf, Cuello A.C. (1986); Mai, J. K., Reifenberger, G. (1988); Pioro, E.P., Mai, J. K., Cuello, A.C. (1990); Walter, A., Jimenez-Härtel, W., Mai J.K. (1990); Walter, A., Mai, J.K., Lanta, L., Görcs T. (1991).



Mai, J.K., Stephens, P., A. Hopf, Cuello A.C. (1986).

2.6.2 References

The full text of the references which are indicated by an asterisk (*) are available on the website: www.thehuman-brain.info

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*Bäumer, H. (1954) Veränderungen des Thalamus bei Schizophrenie. J. Hirnforsch. 1, 156-172.

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Beheim-Schwarzbach, D. (1955) Lebensgeschichte der melaninhaltigen Nervenzellen des Ncl. coeruleus unter normalen und pathogenen Bedingungen. J. Hirnforsch. 2, 62-95.

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*Braitenberg, G. V. (1952) Ricerche istopatologiche sulla corteccia frontale di schizofrenici. Proc. I st. Intl. Cong. Neuropathol. Rom. Rosenberg & Sellier, Torino. Vol. 3, pp. 621-626.

*Brockhaus, H. (1938) Zur normalen und pathologischen Anatomie des Mandelkerngebietes. J. Psychol. Neurol. 49, 1-136.

*Brockhaus, H. (1940) Die Cyto- und Myeloarchitektonik des Cortex claustralis und des Claustrum beim Menschen. J. Psychol. Neurol. 49, 249-348.

*Brockhaus, H. (1942) Beitrag zur normalen Anatomie des Hypothalamus und der Zona incerta beim Menschen. J. Psychol. Neurol. 51, 96-195.

*Brockhaus, H. (1942) Vergleichend-anatomische Untersuchungen über den Basalkernkomplex. J. Psychol. Neurol. 51, 57-95.

*Brockhaus, H. (1942) Zur feinen Anatomie des Septum und des Striatum. J. Psychol. Neurol. 51, 1-56. Translated in: Human Brain Dissection. Pope A. ed. (1983) U.S. Government Printing Office Publ. 381-132: 3096.

*Busch, K.-T. (1960) Individuelle architektonische Differenzen der Area striata. J. Hirnforsch. 4, 535-552.

*Buttlar-Brentano, K.v. (1954) Zur Lebensgeschichte des Ncl. basalis, tuberomammillaris, supraopticus und paraventricularis unter normalen und pathogenen Bedingungen. J. Hirnforsch. 1, 337-419.

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*Dom, R., De Saedeleer, J., Bogerts, B., Hopf, A. (1981) Quantitative cytometric analysis of basal ganglia in catatonic schizophrenics. In: Biological Psychiatry (eds. Perris, C. Struwe, G & Jansson B), Elsevier, North-Holland pp. 723-726.

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*Falkai, P. (1988). Hippocampal pathology in schizophrenia. A morphometric study. Thesis, Düsseldorf.

*Fünfgeld, E.W. (1952) Pathologisch-anatomische Untersuchungen im Nucleus anterior thalami bei Schizo phrenie, Proc. I st . Intl. Cong. Neuropathol. Rom. Rosenberg & Sellier, Torino. Vol. 3, pp. 648-659.

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Index

List of Structures

Names of structures are listed separately for different regions(Cortex regions; Gyri, Surface Morphology; Sulcii; ...). Each name is followed by the abbreviation of the structure.

Cortex regions
agranular insular cortex (claustrocortex insularis) AIn
amygdalohippocampal area AHi
...
Gyri, Surface Morphology
ambiens gyrus AG
amygdalostriatal transition area AStr
...

Cortex regions

agranular insular cortex (claustrocortex insularis) AIn
amygdalohippocampal area AHi
anterior cingulate cortex (B.Vogt) ACC
anterior midcingulate cortex (B.Vogt) aMCC
area orbitoinsularis AOI
area piriformis insulae API
Brodmann areas 1-52 BA1-52
CA1 field of hippocampus CA1
CA2 field of hippocampus CA2
CA3 field of hippocampus CA3
cortico-amygdaloid transition area CxA
dorsal presubiculum dPrS
dorsal temporopolar region DTP
entorhinal cortex EC
entorhinal cortex Ent
entorhinal cortex, caudal limiting subfield ECL
entorhinal cortex, caudal subfield Ec
entorhinal cortex, intermediate subfield EI
entorhinal cortex, lateral caudal subfield ELC
entorhinal cortex, lateral rostral subfield ELR
entorhinal cortex, medial intermediate subfield EMI
entorhinal cortex, olfactory subfield Eo
entorhinal cortex, rostral subfield ER
fascia dentata FD
fields of hippocampus CA1-3
fimbria of the hippocampus fi
frontal limbic area FLA
frontopolar cortex (or gyrus) FrP
hippocampal head HiH
hippocampo amygdaloid transitional area HATA
hippocampus Hi
insula Ins
lateral temporopolar cortex TPCl
lingual-parahippocampal transition area LPHT
margo denticulatus MDe
medial temporopolar cortex TPCm
olfactory area OlfA
parahippocampal area TF TF
parahippocampal area TH TH
parahippocampal-amygdaloid transition area PHA
parainsular region PIR
parastriate area PStr
parasubiculum PaS
parietooccipital transition zone POTZ
periamygdalar area PAA
periamygdaloid cortex PAC
periamygdaloid cortex PAM
perirhinal cortex PRC
perirhinal cortex, BA 35 PRC35
perirhinal cortex, BA 36 PRC36
perisplenial cortex(B.Vogt) PSC
piriform cortex Pir
piriform cortex, frontal part PirF
piriform cortex, temporal part PirT
postcentral insular cortex PCI
posterior cingulate cortex (B.Vogt) PCC
posterior midcingulate cortex (B.Vogt) pMCC
precommissural archicortex PCA
precuneiform area PrCuF
precuneus PCun
presubiculum PrS
retrosplenial cortex RSC
retrosplenial limbic gyri RSG
striate area AStr
subcallosal area SCA
subiculum S
temporooccipital transition zone TOTZ
temporopolar cortex TPC

Gyri, Surface Morphology

ambiens gyrus AG
amygdalostriatal transition area AStr
angular gyrus AnG
angular gyrus, anterior division AAnG
anterior (intermediate) orbital gyrus AOrG
anterior (intermediate) orbital gyrus, lateral part AOrGL
anterior (intermediate) orbital gyrus, medial part AOrGM
anterior angular gyrus AAnG
anterior central operculum COp-a
anterior orbital gyrus, lateral part AOrG-l
anterior orbital gyrus, medial part AOrG-m
anterior subcentral gyrus ASCe
anterior transverse temporal gyrus TTG1
arcus parieto-occipitalis, anterior division APOc-a
arcus parieto-occipitalis, posterior division APOc-p
basal operculum BOp
brainstem BSt
central operculum (Rolandi) COp
cerebellar hemisphere CH
cerebellum Cb
cingulate gyrus CG
cuneal point *CP
cuneolingual gyrus (in depth) *X
cuneus Cun
dentate gyrus DG
diverticulum unci du
fasciolar gyrus FG
frontal dimple fd
frontal lobe FL
frontal operculum FOp
frontal pole FP
frontomarginal gyrus FMG
fusiform gyrus FuG
fusiform gyrus, posterior part FuG-p
gyri Andreae Retzii ARG
gyrus ambiens GA
gyrus descendens GDe
gyrus semilunaris GSL
gyrus uncinate GU
inferior frontal gyrus IFG
inferior frontal gyrus, ascending part IFG-asc
inferior frontal gyrus, basilar part IFG-ba
inferior frontal gyrus, opercular part IFGOp
inferior frontal gyrus, orbital part IFGOr
inferior frontal gyrus, triangular part IFGTr
inferior frontopolar gyrus IFPG
inferior lingual gyrus ILG
inferior lingual gyrus ILgG
inferior lingual gyrus, lateral part ILG-l
inferior lingual gyrus, medial part ILG-m
inferior occipital gyrus IOG
inferior parietal lobule IPL
inferior rostral gyrus IRoG
inferior sagittal gyrus ISG
inferior temporal gyrus ITG
inferior temporopolar region ITP
infundibular stalk InfS
insular gyrus IG
insular pole IPo
intermediate orbital gyrus IOrG
isthmus I
isthmus of cingulate gyrus ICG
lamina terminalis LT
lateral fusiform gyrus LFuG
lateral orbital gyrus LOrG
limen insulae Li
lingual gyrus (O5) LgG
medial fusiform gyrus MFuG
medial orbital gyrus MOrG
medulla oblongata Md
middle frontal gyrus MFG
middle frontopolar gyrus MFPG
middle occipital gyrus MOG
middle sagittal gyrus MSG
middle temporal gyrus MTG
occipital gyrus (gyri) OcG
occipital pole OcP
occipito-temporal gyrus OTG
olfactory bulb OB
olfactory trigone OTr
optic papilla pap
orbital gyrus/gyri OrG
orbitofrontal gyri OFG
paracentral fossa pcf
paracentral lobule PCL
paracingulate gyrus PCg
parahippocampal gyrus PHG
paraterminal gyrus PTG
parietal operculum POp
parieto-occipital arc (first parieto-occipital « plis de passage » of Gratiolet) POc
parieto-occipital arc, anterior part POc-A
parieto-occipital arc, posterior part POc-P
perisplenial gyri (von Economo) PSG
planum polare PPo
planum polare, lateral part PPo-l
planum temporale PTe
pons Pons
postcentral gyrus PoG
posterior angular gyrus PAnG
posterior central operculum COp-p
posterior orbital gyrus POrG
posterior subcentral gyrus PSCe
posterior transverse temporal gyrus TTG2
posteromedial orbital lobule PMOL
precallosal gyrus PCG
precentral gyrus PrG
preoccipital notch pi
radiation of straight gyrus rsg
radiation of straight gyrus sgr
rostral gyrus RoG
spinal cord Spinal
straight gyrus SG
striate area (Brodmann area 17) 17
subcallosal gyrus SCG
subsplenial gyrus SSpG
superior frontal gyrus SFG
superior frontal gyrus, lateral part SFGL
superior frontal gyrus, medial part SFGM
superior frontopolar gyrus SFPG
superior lingual gyrus SLG
superior lingual gyrus SLgG
superior medullary velum SMV
superior occipital gyrus SOG
superior occipital gyrus, lat part SOG-l
superior occipital gyrus, medial part SOG-m
superior parietal lobule SPL
superior rostral gyrus SRoG
superior sagittal gyrus SSG
superior sagittal gyrus, anterior part SSG-a
superior sagittal gyrus, posterior part SSG-p
superior temporal gyrus STG
supramarginal gyrus SMG
temporal lobe TL
temporal operculum TOp
temporal pole TP
temporopolar gyrus TPG
transverse insular gyrus TIG
transverse temporal gyrus/gyri TTG
uncal notch unn

uncus Un
vermis of cerebellum Ver

Sulci

accessory callosal sulcus acals
accessory superior frontal sulcus asfs
accessory superior frontal sulcus, lateral ramus asfs-l
accessory superior frontal sulcus, medial ramus asfs-m
accessory supraorbital sulcus asos
angular sulcus angs
anterior intermediate parietal sulcus (Jensen) impI
anterior intermediate parietal sulcus of Jensen imI
anterior occipital sulcus aos
anterior occipital sulcus, dorsal segment aos-d
anterior occipital sulcus, inferior ramus aos-i
anterior occipital sulcus, superior ramus aos-s
anterior parietal sulcus (Vogt), (precuneal limiting sulcus) apa
anterior parolfactory sulcus aps
anterior parolfactory sulcus, inferior branch apsi
anterior parolfactory sulcus, superior branch apss
anterior subcentral sulcus ascs
anterior transverse collateral sulcus atcos
calcarine sulcus cs
calcarine sulcus, anterior part acs
calcarine sulcus, central part ccs
calcarine sulcus, central part cs-c
callosal sulcus cals
central sulcus ce
choroidal fissure chf
cingulate sulcus cgs
cingulate sulcus, anterior p cgs-a
cingulate sulcus, posterior p cgs-p
circular insular sulcus cis
collateral sulcus (medial occipitotemporal sulcus) cos
collateral sulcus, occipital ramus cos-o
collateral sulcus, parahippocampal ramus cos-ph
collateral sulcus, temporal ramus cos-t
cuneal limiting sulcus culs
diagonal sulcus dgs
endorhinal sulcus ers
fragmentosus sulcus frs
frontal paramidline sulcus fmps
frontal paramidline sulcus fpms
frontomarginal sulcus fms
fronto-orbital sulcus fors
frontopolar sulcus fps
Heschl sulcus sH
hippocampal fissure hf
inferior cingulate sulcus cgs-i
inferior frontal sulcus ifs
inferior frontopolar sulcus ifps
inferior occipital sulcus ios
inferior postcentral sulcus ipocs
inferior precentral sulcus iprs
inferior sagittal sulcus (S. limitans superior) iss
inferior temporal sulcus its
intermediate frontal sulcus imfs
intermediate orbital sulcus imos
intermediate orbital sulcus iors
intralingual sulcus ils
intraparietal sulcus ips
intraparietal sulcus, horizontal segment ips-h
intrarhinal sulcus irhs
intrarhinal sulcus irs
lateral (Sylvian) fissure lf
lateral fissure, horizontal segment lf-h
lateral fissure, anterior segment lf-a
lateral fissure, middle segment lf-m
lateral fissure, posterior segment lf-p
lateral fissure, vertical segment lf-v
lateral frontomarginal sulcus lfms
lateral occipitotemporal sulcus lots
lateral orbital sulcus lors
lateral occipital sulcus los
lingual sulcus lgs
lingual sulcus, posterior ramus lg-p
lunate sulcus lus
marginal precentral sulcus maprs
marginal segment of cingulate sulcus cgs-mg
medial frontomarginal sulcus mfms
middle frontopolar sulcus mfps
middle orbital sulcus mors
midfusiform sulcus mfs
occipitopolar sulcus (extreme fissure of Seitz) ops
olfactory sulcus olfs
orbital sulcus ors
paracentral sulcus pacs
paracingulate sulcus pcgs
paraterminal sulcus pts
parieto-occipital fissure pof
polar sulcus ps
postcentral sulcus pocs
posterior orbital sulcus pors
posterior orbital sulcus, middle branch porsm
posterior paramidline sulcus ppms
posterior parietal sulcus (Vogt) ppa
posterior parolfactory sulcus pps
posterior transverse collateral sulcus ptcos
postreme subcallosal sulcus posc
precentral sulcus prs
precuneal limiting sulcus prculs
precuneal sulcus prcus
preolfactory transverse sulcus polfs
preopercular sulcus prop
pretriangular sulcus prts
radiate sulcus (Eberstaller) ras
retrocalcarine sulcus, lower branch rcs-i
retrocalcarine sulcus, upper branch rcs-s
rhinal sulcus rhs
rostral sulcus ros
rostral sulcus, inferior (lower) branch ros-i
rostral sulcus, superior (upper) branch ros-s
second intermediate parietal sulcus imII
semiannular sulcus sas
subcalcarine sulcus scs
subparietal sulcus sbps
sulcus acusticus acus
sulcus semiannularis ssa
superior frontal sulcus sfs
superior frontopolar sulcus sfps
superior occipital sulcus sos
superior parietal sulcus spas
superior postcentral sulcus spcs
superior precentral sulcus sprs
superior sagittal sulcus sss
superior temporal sulcus sts
superior temporal sulcus, anterior segment sts-a
superior temporal sulcus, ascending segment sts-asc
superior temporal sulcus, horizontal segment sts-h
superior temporal sulcus, posterior segment sts-p
supraorbital sulcus sors
third intermediate parietal sulcus imIII
transverse occipital sulcus tos
transverse occipital sulcus, lateral ramus tos-l
transverse occipital sulcus, medial ramus tos-m
transverse orbital sulcus tors
transverse temporal sulcus tvt
triangular sulcus ts
uncal sulcus us
vertical ramus of lateral fissure lfv

Ventricular system, CSF

arachnoid granulations argr
calcar avis cal
cavity of septum pellucidum CSP
central part of lateral ventricle CLV
cerebral aqueduct (Sylvius) Aq
choroid plexus chpx
cistern Ci
fourth ventricle 4V
frontal horn of lateral ventricle FLV
great (cerebellomedullary) cistern GrCi
interpeduncular cistern IPCi
interpeduncular fossa IPF
interventricular foramen IVF
lateral ventricle LV
occipital horn of lateral ventricle OLV
pontine cistern PoCi
preoptic recess of the third ventricle P3V
subarachnoid space SArS
tela choroidea of the lateral ventricle tclv
temporal horn of lateral ventricle TLV
tenia of fimbria tfi
tenia of fornix tfx
tenia of thalamus tt
tenia semicircularis tsc
third ventricle 3V
trigone of lateral ventricle TrLV
velum terminale vt

Nuclei and Subcortical Brain Areas

accessory basal amygdaloid nucleus AB
accumbens nucleus Ac
accumbens nucleus, central part AcC
accumbens nucleus, lateral part AcL
accumbens nucleus, medial part AcM
amygdala Amg
amygdaloid island (extended amygdala) AI
anterior (oral) pulvinar nucleus APul
anterior amygdaloid area AAA
anterior cortical amygdaloid nucleus ACo
anterior cortical amygdaloid nucleus, dorsal part ACoD
anterior cortical amygdaloid nucleus, ventral part ACoV
anterior hypothalamic area AHA
anterior lateral preoptic nucleus ALPO
anterior medial preoptic nucleus AMPO
anterior olfactory nucleus (retrobulbar region) AO
anterior olfactory nucleus, posterior part AOP
anterior perforated substance APS
anterior thalamic nucleus ATh
anterior ventrolateral thalamic nucleus VLA
anterior ventrolateral thalamic nucleus, external part VLAE
anterior ventrolateral thalamic nucleus, internal part VLAI
anterodorsal pulvinar nucleus (lateral posterior nucleus) ADPul
anterodorsal thalamic nucleus AD
anteromedial thalamic nucleus AM
anteroprincipal (anteroventral) thalamic nucleus APr
anteroventral nucleus (anteroprincipal nucleus) AV
anteroventral periventricular hypothalamic nucleus AVPe
arcuate nucleus Arc
basal (inferior) ventrolateral thalamic nucleus [VPI] (entry zone of the cerebellar fibers) VLb
basal nucleus, compact part BC
basal nucleus, diffuse part BD
basal ventroanterior thalamic nucleus [VM] (entry zone of nigral and amygdaloid afferents) VAb
basal ventroposterior nucleus [VMpo] (entry zone of sensory afferents) VPb
basolateral amygdaloid nucleus BL
basolateral amygdaloid nucleus, dorsal (magnocellular) part BLD
basolateral amygdaloid nucleus, intermediate part BLI
basolateral amygdaloid nucleus, paralaminar part BLPL
basolateral amygdaloid nucleus, ventrolateral part BLVL
basolateral amygdaloid nucleus, ventromedial part BLVM
basomedial amygdaloid nucleus BM
basomedial amygdaloid nucleus, centromedial part BMCM
basomedial amygdaloid nucleus, dorsolateral part BMDL
basomedial amygdaloid nucleus, dorsomedial part BMDM
basomedial amygdaloid nucleus, ventromedial part BMVM
bed nucleus of the stria terminalis BST
bed nucleus of the stria terminalis, central division BSTC
bed nucleus of the stria terminalis, lateral division BSTL
bed nucleus of the stria terminalis, lateral division, juxtacapsular part BSTLJ
bed nucleus of the stria terminalis, medial division BSTM
bed nucleus of the stria terminalis, posterior division BSTP
bed nucleus of the stria terminalis, posterior division, lateral part BSTPL
bed nucleus of the stria terminalis, posterior division, medial part BSTPM
bed nucleus of the stria terminalis, ventral division BSTV
body of caudate nucleus BCd
capsule of red nucleus cr
caudate nucleus Cd
central amygdaloid nucleus Ce
central amygdaloid nucleus, lateral part CeL
central amygdaloid nucleus, medial part CeM
central medial thalamic nucleus CeMe
centromedian thalamic nucleus CM
claustrum Cl
commissural nucleus Co
compact insular claustrum CoCl
cucullaris nucleus Cuc
cuneiform area CuA
cuneiform nucleus CuF
dentate nucleus Dt
diffuse insular claustrum DiCl
diffuse pulvinar nucleus DiPul
dorsal claustrum DCl
dorsal hypothalamic area DH
dorsal hypothalamic nucleus DoH
dorsal periventricular hypothalamic nucleus DPeH
dorsal raphe nucleus DR
dorsal superficial nucleus DSF
dorsal tegmental nucleus DTg
dorsomedial hypothalamic nucleus DMH
dorsomedial hypothalamic nucleus, compact part DMHC
Edinger-Westphal nucleus EW
entopeduncular nucleus EP
extended amygdala EA
external globus pallidus EGP
fasciculosus nucleus Fa
fundus region of caudate nucleus FCd
fundus region of putamen FPu
fundus striati FStr
globus pallidus GP
great terminal island GTI
habenula Hb
head of caudate nucleus HCd
H-field of Forel H
horizontal limb of the diagonal band HDB
hypothalamus Hy
indusium griseum IGr
inferior colliculus IC
inferior olive IO
inferior pulvinar nucleus IPul
inferior pulvinar nucleus, dorsal part IDPul
inferior pulvinar nucleus, intermediate part ILPul
inferior pulvinar nucleus, ventral p IVPul
infundibular nucleus Inf
interfascicular nucleus IF
intergeniculate pulvinar nucleus IGPul
internal globus pallidus IGP
interpeduncular nucleus IP
interstitial nucleus of the posterior limb of the anterior commissure IPAC
interthalamic adhesion IThA
lateral amygdaloid nucleus La
lateral amygdaloid nucleus, dorsal anterior part LaDA
lateral amygdaloid nucleus, dorsal lateral part LaDL
lateral amygdaloid nucleus, dorsomedial part LaDM
lateral amygdaloid nucleus, intermediate part LaI
lateral amygdaloid nucleus, ventral part LaV
lateral caudate nucleus CdL
lateral dorsal thalamic nucleus LD
lateral geniculate nucleus LG
lateral habenular nucleus LHb
lateral hypothalamic area LH
lateral mammillary nucleus LM

lateral pulvinar nucleus LPul
lateral septal nucleus, dorsal part LSD
lateral septal nucleus, intermediate part LSI
lateral septal nucleus, ventral part LSV
lateral terminal nucleus of the accessory optic system LTN
lateral thalamic nuclear region LTh
lateral tuberal nucleus LTu
lateral ventroanterior thalamic nucleus VAL
lateral ventroposterior thalamic nucleus VPL
laterodorsal nucleus, oral part LDO
laterodorsal nucleus, superficial part LDSF
laterodorsal tegmental nucleus LDTg
limitans claustrum LiCl
limitans nucleus Lim
limitans putamen PuLi
locus coeruleus LC
mammillary body MB
medial amygdaloid nucleus Me
medial amygdaloid nucleus, anterior part MeA
medial caudate nucleus CdM
medial geniculate nucleus MG
medial geniculate nucleus, dorsal posterior part MGDP
medial geniculate nucleus, fibrosus part MGFi
medial geniculate nucleus, limitans part MGLi
medial geniculate nucleus, magnocellular part MGMC
medial geniculate nucleus, parvocellular part MGPC
medial habenular nucleus MHb
medial mammillary nucleus, lateral part ML
medial mammillary nucleus, medial part MM
medial preoptic nucleus MPO
medial preoptic nucleus, lateral part MPOL
medial pulvinar nucleus MPul
medial putamen PuM
medial septal nucleus MS
medial ventroanterior thalamic nucleus VAM
medial ventroposterior thalamic nucleus VPM
medial ventroposterior thalamic nucleus, parvicellular part VPMPC
median eminence ME
median preoptic nucleus MnPO
median raphe nucleus MnR
mediodorsal thalamic nucleus MD
mediodorsal thalamic nucleus, magnocellular part MDMC
mediodorsal thalamic nucleus, paralamellar part MDPL
mediodorsal thalamic nucleus, parvicellular part MDPC
mediolateral pulvinar nucleus MLPul
mesencephalic trigeminal nucleus Me5
microcellular tegmental nucleus MiTg
nucleus Darkschewitsch Dk
nucleus of the diagonal band DB
nucleus of the diagonal band, angular part ADB
olfactory tubercle Tu
pallidohypothalamic nucleus PalHy
parabigeminal nucleus PBG
parabrachial pigmented nucleus PBP
parafascicular thalamic nucleus PF
paranigral nucleus PN
paraoptic nucleus PaO
paratenial thalamic nucleus PT
paraventricular hypothalamic nucleus Pa
paraventricular hypothalamic nucleus, anterior parvocellular part PaAP
paraventricular hypothalamic nucleus, dorsal part PaD
paraventricular hypothalamic nucleus, fornical part PaFo
paraventricular hypothalamic nucleus, magnocellular part PaMC
paraventricular hypothalamic nucleus, parvocellular part PaPC
paraventricular hypothalamic nucleus, posterior part PaPo
paraventricular thalamic nucleus PV
peduncle of lentiform nucleus PedL
periaqueductal gray PAG
perifornical nucleus PeF
peripeduncular area PPA
peripeduncular nucleus PP
periventricular nucleus Pe
pineal gland Pi
posterior cortical amygdaloid nucleus PCo
posterior hypothalamic area PH
posterior ventrolateral thalamic nucleus VLP
posterior ventrolateral thalamic nucleus, external part VLPE
posterior ventrolateral thalamic nucleus, internal part VLPI
preamygdalar claustrum PACl
prepiriform claustrum PPCl
prereticular zone PRt
pretectal area PTc
pulvinar thalami Pul
putamen Pu
quadrigeminal plate QP
red nucleus R
red nucleus, parvocellular part RPC
reticular thalamic nucleus Rt
reticular thalamic nucleus Rt
reuniens thalamic nucleus Re
rostral linear nucleus RLi
septofimbrial nucleus SFi
septum pellucidum SptP
sexual dimorphic nucleus SxD
striatal cell bridge(s) SB
subcaudate terminal island SCTI
subfornical organ SFO
subparafascicular thalamic nucleus SPF
substantia gliosa (subependymal gray) SGl
substantia nigra SN
substantia nigra, pars compacta SNC
substantia nigra, pars reticulata SNR
substriatal terminal island SSTI
subthalamic nucleus STh
superficial pulvinar nucleus SFPul
superior colliculus SC
superior pulvinar nucleus SPul
superior ventroposterior thalamic nucleus (Kaas) VPS
supracapsular part of the globus pallidus SCGP
suprachiasmatic nucleus SCh
suprageniculate nucleus SGe
supramammillary nucleus SuM
supraoptic nucleus SO
supraoptic nucleus, dorsolateral part SODL
supraoptic nucleus, ventromedial part SOVM
tail of caudate nucleus TCd
tectum of midbrain Tec
temporal claustrum TCl
thalamus Th
triangular septal nucleus TS
tubercular terminal islands TuTI
tuberomammillary complex TMC
tuberomammillary nucleus TM
ventral caudate nucleus CdV
ventral claustrum VCl
ventral extension of BSTC BSTCV
ventral pallidum VGP
ventral periventricular hypothalamic nucleus VPeH
ventral putamen PuV
ventral tegmental area VTA
ventroanterior thalamic nucleus (ventral anterior nucleus) VA
ventroanterior thalamic nucleus, magnocellular part VAMC
ventrointermedius nucleus VIM
ventrolateral thalamic nucleus VL
ventromedial hypothalamic nucleus VMH
ventromedial hypothalamic nucleus, dorsomedial part VMHDM
ventromedial hypothalamic nucleus, ventrolateral part VMHVL
ventroposterior thalamic nucleus VP
ventroposterior thalamic nucleus, parvicellular part VPPC
vertical limb of the diagonal nucleus VDB
zona incerta ZI
zona incerta, dorsal part ZID
zona incerta, ventral part ZIV

Fibers

alveus of the hippocampus alv
angular bundle Ab
ansa cervicalis ancer
ansa lenticularis al
ansa peduncularis ap
anterior commissure ac
anterior commissure, anterior (olfactory) limb aco
anterior corona radiata acr
anterior limb of the internal capsule aic
anterior longitudinal ligament all
anterior thalamic peduncle athp
anterior thalamic radiation atr
apical ligament of dens ald
arcuate fasciculus arc
auditory radiation aud
band of Giacomini bG
body of corpus callosum bcc
body of fornix bfx
brachium of the inferior colliculus bic
brachium of the superior colliculus bsc
capsule of medial geniculate nucleus cmg
central tegmental tract ctg
cerebello-rubro thalamic fibers (dentato-thalamic tract) crt
cerebral peduncle cp
cingulum bundle cgb
column of fornix cfx
comb system comb
commissure of the inferior colliculi cic
commissure of the superior colliculi csx
corpus callosum cc
corticospinal tract cst
crus of fornix crfx
decussation of the superior cerebellar peduncles xscp
diagonal band (Bandeletta diagonalis, Broca) db
dorsal hippocampal commissure dhx
dorsal tegmental decussation dtx
dorsal trigeminothalamic tract tth
external capsule ec
external medullary lamina of the thalamus eml
extreme capsule ex
fasciculus mammillaris princeps mpr
fasciculus retroflexus (habenulo-interpeduncular tract) fr
forceps major of the corpus callosum fmj
forceps minor of the corpus callosum fmi
fornix fx
fornix longus fxl
genu of fornix gfx
genu of the corpus callosum gcc
genu of the internal capsule gic
habenular commissure hbx
hippocampal commissure hx
incomplete medullary lamina of the globus pallidus icml
inferior fronto-occipital fasciculus ifo
inferior longitudinal fasciculus ilf
inferior thalamic peduncle ithp
internal capsule ic
internal medullary lamina of the thalamus iml
internal sagittal stratum isst
lateral lemniscus ll
lateral longitudinal stria lls
lateral medullary lamina of the globus pallidus lml
lateral olfactory tract lo
lenticular fasciculus h2
lenticular fasciculus lenf
limiting medullary lamina of the globus pallidus liml
longitudinal stria ls
mammillotegmental tract mtg
mammillothalamic tract mt
medial forebrain bundle mfb
medial lemniscus ml
medial longitudinal fasciculus mlfc
medial longitudinal stria mls
medial medullary lamina of the globus pallidus mml
medial olfactory radiation molf
middle cerebellar peduncle mcp
middle longitudinal fasciculus mlf
olfactory peduncle 1p
olfactory radiation olfr
olfactory tract olf
optic chiasma ox
optic radiation or
optic tract opt
orbitofrontal fibers ofr
pallidohypothalamic fibers palhy
pallidosubthalamic fibers psf
pontine fibers pons
posterior commissure pc
posterior corona radiata pcr
posterior limb of the internal capsule pic
posterior thalamic radiation ptr
precommissural fornix pcfx
principal mammillary fasciculus prf
pyramidal tract py
radiation of corpus callosum racc
rostrum of corpus callosum rcc
sagittal stratum sstr
spinothalamic tract spth
splenium of the corpus callosum scc
stria medullaris of thalamus sm
stria terminalis st
subcallosal fasciculus scal
subcallosal stratum SCS
subependymal stratum SEpS
sublenticular part of the internal capsule slic
sublenticular stria sls
superficial medullary stratum sms
superior cerebellar peduncle scp
superior corona radiata scr
superior fronto-occipital fasciculus sfo
superior longitudinal fasciculus slf
superior longitudinal fasciculus I, dorsal component slfI
superior longitudinal fasciculus II, central component slfII
superior longitudinal fasciculus III, ventral component slfIII
superior occipitofrontal fasciculus sof
superior thalamic stria str
supramammillary commissure sumx
supraoptic commissure sox
tapetum tp
thalamic fasciculus h1
thalamic radiation (corona radiata) thr
triangular area (Wernicke) TrA
uncinate fasciculus unc
ventral amygdalofugal fibers (pathway) vaf
ventral tegmental decussation vtx

Nerves, Ganglia

abducens nerve or its root 6n
accessory nerve 11n
auriculotemporal nerve 5au
buccal nerve bucn
carotid plexus cpx
cervical nerve cern
cervical plexus cerpx
chorda tympani cty
facial nerve or its root 7n
frontal nerve 5fr
glossopharyngeal nerve 9n
greater occipital nerve gocn
greater petrosal nerve 7gp
hypoglossal nerve or its root 12n
inferior alveolar artery, vein and nerve ial
inferior alveolar nerve 5ial
infraorbital nerve 5ior
lacrimal nerve 5lac
lingual nerve 5lg
mandibular nerve 5man
maxillary nerve 5mx
motor root of trigeminal nerve 5mo
mylohyoid nerve myhy

nasociliary nerve 5nc
occipital artery, vein and (greater occipital) nerve occ
oculomotor nerve 3n
oculomotor nerve (inferior branch) 3ni
oculomotor root 3r
ophthalmic nerve 5oph
optic nerve 2n
optic tract opt
otic ganglion Otic
palatine nerve (s) paln
parotid plexus papx
pharyngeal branches phar
posterior superior alveolar nerve psan
pterygopalatine ganglion PtgPal
superior cervical ganglion SCGn
superior laryngeal nerve sln
supratrochlear nerve sutrn
sympathetic trunk Symp
trigeminal ganglion 5Gn
trigeminal nerve 5n
trochlear nerve or its root 4n
vagus nerve 10n
ventral root vr
vestibulocochlear nerve 8n

Arteries, Veins and Sinuses

(anterior) choroidal artery cha
angular artery anga
angular artery and vein ang
angular vein angv
anterior auricular artery aaua
anterior cerebral artery acer
anterior inferior cerebellar artery aica
ascending palatine artery apala
ascending pharyngeal artery aph
basilar artery bas
callosal vein calv
cavernous sinus cavs
central artery of retina cret
common carotid artery cctd
confluence of sinuses cosi
deep cervical artery and vein dpc
deep lingual artery and vein dlg
deep temporal artery dta
descending palatine artery dpala
diploic vein dip
emissary vein emi
external carotid artery ectd
external jugular vein ejugv
facial artery (glandular branches) fac
facial vein facv
greater palatine artery gpala
greater palatine artery, vein and nerve gpal
greater palatine vein gpalv
inferior alveolar artery iala
inferior alveolar artery, vein and nerve ial
inferior alveolar vein ialv
inferior labial artery and vein ilab
inferior petrosal sinus ipets
inferior sagittal sinus issi
inferior temporal artery ita
infraorbital artery iora
internal carotid artery ictd
internal cerebral vein icv
internal jugular vein (sigmoid sinus/jugular bulb) ijugv
internal nasal vein inav
internal vertebral venous plexus ivvpx
labial artery lab
lacrimal artery lac
lacrimal vein lacv
lingual artery lga
lingual vein lgv
maxillary artery mxa
maxillary vein mxv
middle cerebral artery mcer
middle meningeal artery mm
middle meningeal artery, frontal branch mmf
middle meningeal artery, parietal branch mmp
nasopalatine artery (sphenopalatine artery) npal
occipital artery occa
occipital artery, vein and (greater occipital) nerve occ
occipital vein occv
ophthalmic artery opha
ophthalmic vein ophv
posterior auricular artery paua
posterior auricular artery and vein pau
posterior auricular vein pauv
posterior cerebral artery pcer
posterior communicating artery pcoma
posterior inferior cerebellar artery pica
posterior nasal artery pna
posterior superior alveolar artery psa
posterior superior alveolar nerve psan
pterygoid plexus ptgpx
retroarticular (venous) plexus rapx
retromandibular vein rmv
septal vein sv
sphenopalatine artery sphpal
straight sinus ss
sublingual artery slga
sublingual vein slgv
submental artery sma
submental vein smv
superficial temporal artery sta
superficial temporal vein stv
superior cerebellar artery sca
superior ophthalmic vein sophv
superior posterior alveolar artery spala
superior sagittal sinus sssi
superior temporal artery, frontal branch staf
superior temporal artery, middle branch stam
superior temporal artery, posterior branch stap
superior thyroid artery sthy
superior thyroid vein sthyv
supraorbital artery sora
supratrochlear artery sutra
supratrochlear vein sutrv
temporal vein(s) tv
thalamostriate vein tsv
transverse facial artery tfa
transverse facial vein tfv
transverse sinus trs
vein v
vertebral artery vert

Muscles

anterior cervical intertransversarii muscles AceIT
anterior rectus capitis muscle AReCa
aryepiglotticus muscle AryE
buccinator muscle BucM
cervical interspinal muscle CISM
ciliaris muscle CilM
corrugator supercilii muscle CSCil
depressor anguli oris muscle DpAO
depressor labii inferioris muscle DpLb
depressor supercilii muscle DpSCil
digastric muscle Dig
digastric muscle, tendon DigT
genioglossus muscle GeGl
geniohyoid muscle GeHy
greater zygomaticus muscle MjZyg
hyoglossus muscle HyGl
iliocostalis cervicis muscle ICCe
inferior constrictor muscle of the pharynx ICM
inferior oblique capitis muscle IObCa
inferior oblique muscle (tendon) IOb
inferior rectus muscle IRec
interspinalis muscle ISM
intertransversarii muscles InTrM
lateral pterygoid muscle LPtg
lateral pterygoid muscle, lateral belly LPtgL
lateral pterygoid muscle, medial belly LPtgM
lateral rectus capitis muscle LReCa
lateral rectus muscle LRec
levator anguli oris muscle LAngO
levator labii superioris alaeque nasi muscle LLbAN
levator labii superioris muscle LLb
levator palpebrae superioris muscle LPal
levator scapulae muscle LSc
levator veli palatini muscle LeVePal
longissimus capitis muscle LgsCa
longissimus cervicis muscle LgsCe
longissimus cervicis muscle, tendon LgsCeT
longus capitis and colli muscles LgC
longus capitis muscle LgCa
longus colli muscle LgCo
masseter muscle MasM
medial pterygoid muscle MPtg
medial rectus muscle MRec
mentalis muscle MentM
middle constrictor muscle of the pharynx MCM
middle scalenus muscle MScal
minor zygomaticus muscle MiZyg
multifidus cervicis muscle MuI
mylohyoid muscle MyHy
nasalis muscle Nas
occipito-frontal muscle, frontal belly OcFrF
occipito-frontal muscle, occipital belly OcFrO
omohyoid muscle OmHy
orbicularis oculi muscle OO
orbicularis oris muscle OOr
palatoglossus muscle PalGl
palatopharyngeus muscle PalPh
platysma Plat
posterior auricular muscle PAu
rectus capitis posterior major muscle RePMj
rectus capitis posterior minor muscle RePMi
risorius muscle RisM
salpingopharyngeus muscle SalPh
scalenus muscle ScalM
semispinal cervicis muscle SSpCe
semispinalis capitis muscle SSpCa
spinalis muscle SpM
splenius capitis and cervicis muscle SplM
splenius capitis muscle SplCa
splenius cervicis muscle SplCe
sternohyoid muscle StHy
sternomastoid muscle StM
sternomastoid muscle, tendon StT
styloglossus muscle StyGl
stylohyoid muscle StyHy
stylopharyngeus muscle StyPh
superior and middle constrictor muscle S/MCM
superior constrictor muscle of the pharynx SCM
superior constrictor muscle, pterygopharyngeal part SCMPP
superior oblique capitis muscle SObCa
superior oblique muscle SOb
superior rectus muscle SRec
temporalis muscle TempM
temporalis muscle, tendon TempT
tensor tympani muscle TenT
tensor veli palatini muscle TeVePal
thyrohyoid muscle ThHy
trapezius muscle TzM
zygomatic muscle(s) ZygM

Bones, Joints, Soft (connective) Tissue (tendons, ligaments, fascia, skin, fibrous tissues, fat, and synovial membranes)

anterior arch of atlas AAT
articular disc of temporo-mandibular joint Disc
articular tubercle ATub
atlanto-axial membrane AtAxMe
atlantooccipital joint AtOc
atlantooccipital membrane AtOcMe
atlas (C1 vertebra) Atlas
auditory tube Aud
axis (C2 vertebra) Axis
body of hyoid bone BHy
body of mandible BMan
buccal fat pad BFat
cartilage of auditory tube CAT
cervical vertebra Vert
common anular tendon CAnT
condylar process of the mandible Cond
coronoid process of the mandible Cor
crista galli CGal
dens axis DAx
diaphragma sellae DS
dura mater Dura
epiglottis EGl
ethmoidal cell(s) EthC
external auditory meatus EAud
eyeball eye
falx cerebri FxC
frontal bone Fro
frontal bone, nasal part FroN
frontal bone, orbital part FroO
frontal bone, squamosal part FroSq
frontal bone,crest FroC
frontal sinus FrS
galea aponeurotica (epicranial aponeurosis) gapo
greater horn of hyoid bone GHHy
greater palatine foramen GPalF
hamulus of the pterygoid bone HPtg
hyoid bone Hyoid
hypoglossal canal 12C
incisive canal IncC
inferior nasal concha INaC
infraorbital canal IOrC
infraorbital foramen IOrF
internal auditory meatus IAud
jugular process JugP
lacrimal gland Lac
lambdoid suture lds
lateral lamina of pterygoid process LLPt
lens Lens
lingual follicle LgFo
lingual gland Lg
lingual septum LgSpt
lymph node Ly
major alar cartilage MjAC
mandible Man
mandibular canal ManC
mandibular fossa ManF
mastoid antrum MaA
mastoid cells MstC
mastoid process of temporal bone Mst
maxilla Mx
maxillary sinus MxS
medial lamina of pterygoid process MLPt
middle nasal concha MNaC
nasal bone Na
nasal septum NSpt
nasolacrimal duct nlac
nasopharyngeal tonsil NPhT
nuchal fascia nuf
nuchal ligament nl
occipital bone Occ
occipital sinus occs
occipito-mastoid suture ocm
oral cavity Oral
orbital fat body OFat
palatine bone Pal
palatine gland(s) PalG
palatine tonsil PtT
parietal bone Par
parotid duct ptdd
parotid gland Ptd
perpendicular plate PeP

pharyngeal opening of auditory tube oaud
pharyngeal recess PhRe
piriform recess PirR
pituitary gland Pit
posterior arch of atlas PAT
prevertebral fascia pvf
pterygoid canal PtgC
pterygoid process Ptg
pterygopalatine fossa PtPF
salpingopalatinal fold SPalF
salpingopharyngeal fold SPhF
semicircular canals SCC
semicircular ducts SCD
septal nasal cartilage SeC
sigmoid sinus sigs
soft palate SPal
sphenoid bone Sph
sphenoid sinus SphS
sphenoid, greater wing SphGW
sphenomandibular ligament sphml
sphenoparietal sinus sphps
sphenozygomatic suture sphzg
spinous process of axis SpAx
stylohyoid ligament shl
styloid process Sty
sublingual duct sld
sublingual gland (and duct) SL
submandibular duct smd
submandibular gland SM
superior horn of thyroid cartilage SHThC
superior petrosal sinus spets
temporal bone Temp
temporal bone, petrosal part TempP
temporal fascia tf
temporomandibular disc TMD
tentorium cerebelli TCb
thyrohyoid membrane ThHyMe
thyroid cartilage ThC
torus levatorius TLev
torus tubarius TTub
transverse ligament of atlas tla
transverse process of fourth vertebra TrP4
transverse process of the atlas TrPAt
tympanic cavity TyC
uvula Uv
vocal ligament vl
vomer Vom
zygomatic arch ZygA
zygomatic bone Zyg

List of Abbreviations

The abbreviations are listed in alphabetical order. Each abbreviation is followed by the structure name and the pages on which the abbreviation appears. However, for the sake of legibility we use the tilde symbol „ ~ „ in those cases where a structure appears in successive photographs or diagrams but not on every page.

*CP cuneal point 97, 354
*SP Sylvian point 96
*X cuneolingual gyrus (in depth) 97
10n vagus nerve 31, 33, 36~40, 55, 57, 76, 77
11n accessory nerve 34~39, 57, 77
12C hypoglossal canal 80, 81
12n hypoglossal nerve or its root 30~38, 45, 47, 49, 51, 53, 76, 77, 79-81
17 striate area (Brodmann area 17) 17~25, 66-68, 405-407, 409-411
1p olfactory peduncle 97, 139, 143~171, 409
2n optic nerve 26, 27, 47, 49, 51, 80-83
3n oculomotor nerve 27, 51, 53, 55, 216~251, 256~264, 271
3N oculomotor nucleus 263, 265, 269, 271
3ni oculomotor nerve (inferior branch) 28, 29, 30
3V third ventricle 21-25, 54~58, 197~211, 229~241
4n trochlear nerve or its root 27, 51, 280, 282
4V fourth ventricle 26, 29, 58
5au auriculotemporal nerve 30, 31
5fr frontal nerve 26, 27, 47
5Gn trigeminal ganglion 28, 29, 53, 80, 81
5ial inferior alveolar nerve 31-33, 49, 51, 76-79
5ior infraorbital nerve 30, 31, 33, 34, 45, 47, 49, 79
5lg lingual nerve 30-36, 49, 51, 76-79
5man mandibular nerve 79
5mo motor root of trigeminal nerve 30, 31
5mx maxillary nerve 29, 51
5n trigeminal nerve 27, 55, 80
5nc nasociliary nerve 80
5oph ophthalmic nerve 28, 29
6n abducens nerve or its root 51
7gp greater petrosal nerve 29, 55
7n facial nerve or its root 28, 29, 30, 31, 33, 55, 73
8n vestibulocochlear nerve 29
9n glossopharyngeal nerve 34, 36-38, 49, 51, 53, 57, 76, 78
AAA anterior amygdaloid area 209
AAnG anterior angular gyrus 95, 96, 300~364, 402-404, 411-413
AAT anterior arch of atlas 82
aaua anterior auricular artery 55
AB accessory basal amygdaloid nucleus 193
Ac accumbens nucleus 52, 406-411
ac anterior commissure 54, 55, 79~84, 97, 184~235, 406, 409, 417, 418
acals accessory callosal sulcus 97, 136-139, 142, 144, 148, 150, 154
AcC accumbens nucleus, central part 169, 173, 175, 179~191
ACC anterior cingulate cortex (B.Vogt) 97
ACeIT anterior cervical intertransversarii muscle 55
acer anterior cerebral artery 12~26, 46~66
AcL accumbens nucleus, lateral part 155~187, 193, 406
AcM accumbens nucleus, medial part 169~193, 406
aco anterior commissure, anterior (olfactory) limb 186, 187, 190-193, 196
ACo anterior cortical amygdaloid nucleus 203~214
ACoD anterior cortical amygdaloid nucleus, dorsal part 209, 211, 215
ACoV anterior cortical amygdaloid nucleus, ventral part 209, 211, 215
acr anterior corona radiata 148
acs calcarine sulcus, anterior part 97, 214-216, 286~353
acus sulcus acusticus 96, 220-222, 226
AD anterodorsal thalamic nucleus 217~227, 233~241, 417-420
ADB nucleus of the diagonal band, angular part 193, 428
ADPul anterodorsal pulvinar nucleus (lateral posterior nucleus) 257~269, 422, 423
AG ambiens gyrus 52, 53, 97, 178~234, 408
AH anterior hypothalamic area 203, 205, 209, 211
AHi amygdalohippocampal area 227, 229
AI amygdaloid island (extended amygdala) 209, 211, 221
aic anterior limb of the internal capsule 23, 150~209
aica anterior inferior cerebellar artery 26, 55, 57
AIn agranular insular cortex (claustrocortex insularis) 78-80
al ansa lenticularis 208~256, 410, 417-422
ald apical ligament of dens 82, 83
all anterior longitudinal ligament 37, 38, 83
Alv alveolar process of maxilla 45
alv alveus of the hippocampus 80, 216~247, 259, 263, 293-295, 298, 300, 304
AM anteromedial thalamic nucleus 221, 223, 227, 418, 419, 436
aMCC anterior midcingulate cortex (B.Vogt) 97
Amg amygdala 26, 27, 54-57, 78-80, 239~251, 407, 435
AMPO anterior medial preoptic nucleus
ancer ansa cervicalis 39, 40, 55
ang angular artery and vein 30, 31
AnG angular gyrus 14-19, 63-68, 73-77
anga angular artery 29, 32, 33
angs angular sulcus 95, 96, 364-367, 370-373, 376-379, 383
angv angular vein 27-29
AO anterior olfactory nucleus (retrobulbar region) 52, 151~167
AOI area orbitoinsularis 150~160, 406~412
AOrG anterior (intermediate) orbital gyrus 95, 97, 406~412
AOrG-l anterior orbital gyrus, lateral part 97, 114~138
AOrG-m anterior orbital gyrus, medial part 97, 114~124
aos anterior occipital sulcus 96
aos-d anterior occipital sulcus, dorsal segment 366~379
aos-i anterior occipital sulcus, inferior ramus 96
aos-s anterior occipital sulcus, superior ramus 95, 96
ap ansa peduncularis 208-211, 216, 217, 417
apa anterior parietal sulcus (Vogt), (precuneal sulcus) 95-97
apala ascending palatine artery 33-38
aph ascending pharyngeal artery 36-38, 53
API area piriformis insulae 162~171, 406, 407, 411
APr anteroprincipal (anteroventral) thalamic nucleus see anteroventral thalamic nucleus
aps anterior parolfactory sulcus 97, 162, 163
APS anterior perforated substance 25
apsi anterior parolfactory sulcus, inferior branch 166-169
apss anterior parolfactory sulcus, superior branch 166-169, 173
APul anterior (oral) pulvinar nucleus 257~271, 406, 421-424
Aq cerebral aqueduct (Sylvius) 25, 265, 269~277
ar acoustic radiation 423
arc arcuate fasciculus 118~294
Arc arcuate nucleus 209~217
AReCa anterior rectus capitis muscle 31, 33, 80
ARG gyri Andreae Retzii 289, 292, 294-296
argr arachnoid granulations 59
AryE aryepiglotticus muscle 51
ASCe anterior subcentral gyrus 96
ascs anterior subcentral sulcus 96, 174~184, 196~226
asfs accessory superior frontal sulcus 95, 96, 108~119, 139
asfs-l accessory superior frontal sulcus, lateral ramus 120~143
asfs-m accessory superior frontal sulcus, medial ramus 120~136
asos accessory supraorbital sulcus 97, 108~125
ASt amygdalostriatal transition area 211~223, 229~257
AStr striate area 322~399
AtAx atlanto-axial membrane 83
atcos anterior transverse collateral sulcus 95, 97
ATh anterior thalamic nucleus 23, 55, 56
athp anterior thalamic peduncle
Atlas atlas (C1 vertebra) 33-35, 55~59, 83, 84
AtOc atlantooccipital joint 33, 57, 81
AtOcMe atlantooccipital membrane 83
atr anterior thalamic radiation 154~214
ATub articular tubercle 75
aud auditory radiation 79
Aud auditory tube 51, 78~81
AV anteroventral (anteroprincipal) nucleus 217~245, 259, 263, 405, 406, 409, 417-420, 436
AVPe anteroventral periventricular hypothalamic nucleus 191, 193, 428
Axis axis (C2 vertebra) 37, 55~59, 82, 84
BA 1-52 Brodmann areas 1-52 101~399
bas basilar artery 26-29, 55
bc brachium conjunctivum 406, 409
BC basal nucleus, compact part 193~209, 215, 221~233, 429
bc brachium conjunctivum 409
bcc body of corpus callosum 97, 162~268
BCd body of caudate nucleus 58
BD basal nucleus, diffuse part 203, 205, 209, 211
BFat buccal fat pad 45, 49
bfx body of fornix 56-58, 223~269
bG band of Giacomini 235, 239-242, 245
BHy body of hyoid bone 40
bic brachium of the inferior colliculus 265~287, 424-426
BL basolateral amygdaloid nucleus 203~211, 217, 229, 233, 407~411, 435
BLD basolateral amygdaloid nucleus, dorsal (magnocellular) part 215, 221, 223, 227
BLI basolateral amygdaloid nucleus, intermediate part 215, 221, 223, 227
BLPL basolateral amygdaloid nucleus, paralaminar part 215, 221, 223, 227
BLVL basolateral amygdaloid nucleus, ventrolateral part 215, 223, 227
BLVM basolateral amygdaloid nucleus, ventromedial part 197~223,435
BM basomedial amygdaloid nucleus 197~233, 407, 435
BMan body of mandible 47
BMCM basomedial amygdaloid nucleus, centromedial part 221
BMDL basomedial amygdaloid nucleus, dorsolateral part 221
BMDM basomedial amygdaloid nucleus, dorsomedial part 221, 435
BMVM basomedial amygdaloid nucleus, ventromedial part 221, 435
BNST bed nucleus of the stria terminalis 83, 417, 428, 429, 435
BOp basal operculum 144~160, 406~412
bsc brachium of the superior colliculus 265, 270, 271, 274-277, 280, 283, 424, 425
BSt brainstem 95,
BSTC bed nucleus of the stria terminalis, central division 185~199, 203, 205, 209, 435
BSTCV ventral extension of BSTC 209, 435
BSTL bed nucleus of the stria terminalis, lateral division 185, 191~199
BSTLJ bed nucleus of the stria terminalis, lateral division, juxtacapsular part 187, 203, 205, 209
BSTM bed nucleus of the stria terminalis, medial division 187, 191, 193, 197, 199, 435
BSTP bed nucleus of the stria terminalis, posterior division 203, 205, 209
BSTV bed nucleus of the stria terminalis, ventral division 197, 199, 203, 205, 435
BucM buccinator muscle 34-40, 45, 47, 76-79
bucn buccal nerve 30~38
CA1 CA1 field of hippocampus 223~308
CA1-3 fields of hippocampus
CA2 CA2 field of hippocampus 241~299
CA3 CA3 field of hippocampus 229~302
cal calcar avis 313
cals callosal sulcus 97, 144~317
calv callosal vein 149, 151, 155, 157, 161
CAnT common anular tendon 29
CAT cartilage of auditory tube 33
cavs cavernous sinus 27, 28, 51, 53
Cb cerebellum 78-80
cc corpus callosum 54~58, 82, 167~193, 229, 235, 239~271
ccs calcarine sulcus, central part 95, 97, 405, 406
cctd common carotid artery 39, 40, 53, 55
Cd caudate nucleus 80, 81, 149, 221~283, 404-406, 409, 410, 436
CdL lateral caudate nucleus 151~215
CdM medial caudate nucleus 151~217
CdV ventral caudate nucleus 185~209
Ce central amygdaloid nucleus 211, 215, 217, 235
ce central sulcus 55, 95-97, 214~299
ceis central insular sulcus 178~232
CeL central amygdaloid nucleus, lateral part 221, 223, 227, 229, 233, 420-422
CeM central amygdaloid nucleus, medial part 221, 223, 227, 229, 233
CeMe central medial thalamic nucleus 223, 229, 233, 235, 239, 418-420
cern cervical nerve 39, 40
cern1 cervical nerve1 80, 81
cern2 cervical nerve2 35, 55, 57, 80, 81
cern3 cervical nerve3 55, 80, 81
cerpx cervical plexus 55
cfx column of fornix 196, 198, 202, 204
CG cingulate gyrus 16-25, 49-63, 80-84, 97, 118~322, 403-410
CGal crista galli 27, 45, 47
cgb cingulum bundle 124~322
cgh cingulum (hippocampal part) 222~312
cgs cingulate sulcus 157, 232, 234, 235, 238-241, 244-247, 256~277
cgs-a cingulate sulcus, anterior part 97, 120~205
cgs-i inferior cingulate sulcus 97, 124~161, ~
cgs-mg marginal segment of cingulate sulcus 96, 97, 286~325
cgs-p cingulate sulcus, posterior part 97, 208~283
CH cerebellar hemisphere 57-60
cha (anterior) choroidal artery 22, 26, 52~58
chf choroidal fissure 234~268, 282
chpx choroid plexus 21~25, 57, 60
Ci cistern
cic commissure of the inferior colliculi 280, 282, 286, 287
CilM ciliaris muscle 29
cis circular insular sulcus 150~287
CISM cervical interspinal muscle 61
Cl claustrum 23, 25, 52-54, 55-57, 78, 79, 151~163, 247~257, 407, 408, 434
CLi caudal linear nucleus 263, 265, 269, 271
CLV central part of lateral ventricle 54, 56, 57
CM centromedian thalamic nucleus 56, 57, 82, 245~265, 406, 409, 410, 420~423
cmg capsule of medial geniculate nucleus 274, 275
CM-PF centromedian-parafascicular thalamic complex 406, 409
CnF cuneiform nucleus 277
Co commissural nucleus 229, 233, 241
CoCl compact insular claustrum 167~241
comb comb system 222~246
Cond condylar process of the mandible 30, 31, 53
COp central operculum (Rolandi) 96, 412, 413
COp-a anterior central operculum 214, 216~244, 405, 406, 413
COp-p posterior central operculum 228~255, 404, 405, 413, 414
Cor coronoid process of the mandible 31
cos collateral sulcus (medial occipitotemporal sulcus) 97, 268~385
cosi confluence of sinuses 25, 65
cos-o collateral sulcus, occipital ramus 97
cos-ph collateral sulcus, parahippocampal ramus 95, 97, 220~265
cos-t collateral sulcus, temporal ramus 95, 97, 210, 214, 216, 217
cp cerebral peduncle 25, 55-57, 80, 81, 226~268
cpx carotid plexus 39
cr capsule of red nucleus 239, 241, 245, 247, 251, 420
cret central artery of retina 47
crfx crus of fornix 270, 271~300
crt cerebello-rubro thalamic fibers (dentato-thalamic tract) 238~262, 409, 420-423
cs calcarine sulcus
cs-c calcarine sulcus, central part 354~383
csc commissure of the superior colliculi 271~277, 424, 425
CSCil corrugator supercilii muscle 26, 27
CSP cavity of septum pellucidum 163, 167, 169, 203, 209
ctg central tegmental tract 264, ~271, 424, 425
cty chorda tympani 31, 32
CuA cuneiform area 275
Cuc cucullaris nucleus 229~239, 419, 420
CuF cuneiform nucleus 281, 283
culs cuneal limiting sulcus 97, 376, 378, 382-385, 388, 389
Cun cuneus 20, 63-68, 80, 81, 82, 84, 97
CxA cortico-amygdaloid transition area 203, 205
DAx dens axis 33, 82, 84
dB diagonal band (Bandeletta diagonalis, Broca) 156~184, 197, 199
DB nucleus of the diagonal band 53, 435
DCl dorsal claustrum 203~223, 229, 233, 245
DG dentate gyrus 25, 78, 79, 81, 229~299
dgs diagonal sulcus 96, 154, 156
DH dorsal hypothalamic area 209, 215
dhx dorsal hippocampal commissure 268~289
DiCl diffuse insular claustrum 179~233
Dig digastric muscle 30-40, 45, 47, 51, 53, 55, 57, 74-82
DigT digastric muscle, tendon 38, 39, 49, 78, 79
dip diploic vein 57
DiPul diffuse pulvinar nucleus 424, 425, 426
Disc articular disc of temporo-mandibular joint 30, 31, 75
Dk nucleus Darkschewitsch 251
dlg deep lingual artery and vein 45
DMH dorsomedial hypothalamic nucleus 211, 215, 217, 221, 409, 429, 430
DMHC dorsomedial hypothalamic nucleus, compact part 217, 429, 430
DMHD dorsomedial hypothalamic nucleus, diffuse part 427, 430
DoH dorsal hypothalamic nucleus 203, 205
dpala descending palatine artery 32, 33, 47, 49, 80, 81
DpAO depressor anguli oris muscle 38, 39, 40, 78
DPe dorsomedial periventricular hypothalamic nucleus 428
dpc deep cervical artery and vein 32-40
DPeH dorsal periventricular hypothalamic nucleus 191, 193, 197, 199
DpLb depressor labii inferioris muscle 40, 78
dPrS dorsal presubiculum 227
DpSCil depressor supercilii muscle 28, 29, 30, 31

DR dorsal raphe nucleus 275, 277
DS diaphragma sellae 53
DSf dorsal superficial nucleus see DSF
DSF dorsal superficial nucleus 82, 241, 245, 247, 251~265, 405, 409, 410, 420~424, 436
Dt dentate nucleus 60
dta deep temporal artery 30, 31, 47, 49
DTg dorsal tegmental nucleus 281, 283
DTP dorsal temporopolar region
dtx dorsal tegmental decussation 262
du diverticulum unci 220, 221
Dura dura mater 81
EA extended amygdala 203, 205
EAud external auditory meatus 73, 75
Ec entorhinal cortex, caudal subfield 235, 236, 239
EC entorhinal cortex 179, 181-183
ec external capsule 23, 148~257
ECL entorhinal cortex, caudal limiting subfield 241, 242, 245, 247, 248, 251, 253, 254
ectd external carotid artery 34-39, 53, 74-77
EGl epiglottis 51, 81, 82, 84
EGP external globus pallidus 54, 55, 179~251, 406, 410, 411
EI entorhinal cortex, intermediate subfield 215~233
ejugv external jugular vein 55, 73
ELC entorhinal cortex, lateral caudal subfield 217~233
ELR entorhinal cortex, lateral rostral subfield 185~215
emi emissary vein 29, 59, 61
EMI entorhinal cortex, medial intermediate subfield 209~224
eml external medullary lamina of the thalamus 204, 208, 216~287, 417-426
Ent entorhinal cortex 24-27, 51-59, 95, 97, 166~261, 406-408, 410, 411
Eo entorhinal cortex, olfactory subfield 193, 194, 197, 199, 200, 203, 205, 206
EP entopeduncular nucleus 223, 227
ER entorhinal cortex, rostral subfield 193~212
EthC ethmoidal cell(s) 28, 29, 45, 47, 49
EW Edinger-Westphal nucleus 257, 259, 263, 265
ex extreme capsule 23, 148~226, 234~257
eye eyeball 27, 29, 45
Fa fasciculosus nucleus 215, 217, 221, 223, 227, 417-419
fac facial artery (glandular branches) 34-40, 45, 47, 49, 51, 53, 75-77, 79
facv facial vein 33-37, 40, 45, 47, 49, 51, 53, 75, 76, 79
FCd fundus region of caudate nucleus 155~169, 173~185, 406, 409, 410
fcl fasciculus circumligatus 244, 246, 250, 252
FD fascia dentata 240~252
fd frontal dimple 95, 102, 103, 106
fds fimbriodentate gyrus 250, 252, 268, 288
FF Field of Forel 416, 419, 420
FG fasciolar gyrus 60, 81, 292
fi fimbria of the hippocampus 23, 25, 78, 241~292
FL frontal lobe 47
FLA frontal limbic area 48-56
FLV frontal horn of lateral ventricle 21, 23, 51, 149, 155~169, 175, 187~199
FMG frontomarginal gyrus 95-97, 102~118, 406~411
fmi forceps minor of the corpus callosum 21, 143~169
fmj forceps major of the corpus callosum 21, 286~318
fmps frontal paramidline sulcus 96
fms frontomarginal sulcus 96, 97
FOp frontal operculum 20, 21, 76-79, 96, 148~225, 405, 406, 411-413
fors fronto-orbital sulcus 96
FP frontal pole 96
fp frontopolar fibers 108, 112
fpms frontal paramidline sulcus 95, 150~210
fps frontopolar sulcus 103
fpt frontopontine tract 240, 244, 246, 250
FPu fundus region of putamen 155~209, 406, 407
fr fasciculus retroflexus (habenulo-interpeduncular tract) 238~269, 421-424
Fro frontal bone 25
FroC frontal bone, crest 45, 75
FroN frontal bone, nasal part 26, 27
FroO frontal bone, orbital part 26, 27, 45
FroSq frontal bone, squamosal part 47
FrP frontopolar cortex (or gyrus) 45, 46, 47, 96
frs fragmentosus sulcus 97, 124, 125-127, 130-133, 136
FrS frontal sinus 25, 28, 45, 47
FStr fundus striati 25, 82, 83
FuG fusiform gyrus 23, 49-64, 75-80, 95-97, 166~375, 406-408, 410-412
FuG-p fusiform gyrus, posterior part 352~393
fus midfusiform sulcus 300~304, 318~329
fx fornix 21, 23, 54, 55, 59, 84, 193~223, 406, 407, 409, 417~431
FxC falx cerebri 45, 49
fxl fornix longus 156~174, 186, 196, 198~216
GA gyrus ambiens see AG
gapo galea aponeurotica (epicranial aponeurosis) 25
gcc genu of the corpus callosum 21, 23, 97, 144~163
GDe gyrus descendens 95, 97, 382~399, 405~410
GeGl genioglossus muscle 38-40, 45, 47, 82-84
GeHy geniohyoid muscle 40, 45, 47, 83, 84
GHHy greater horn of hyoid bone 38, 39, 40
gic genu of the internal capsule 23, 222, 226, 229
gocn greater occipital nerve 25, 29-36, 78-81
GP globus pallidus 23, 56, 57, 79-81, 436
gpal greater palatine artery, vein and nerve 45
gpala greater palatine artery 34-37
GPalF greater palatine foramen 47
GrCi great (cerebellomedullary) cistern 59
GSL gyrus semilunaris 203, 205, 209, 211, 215, 221
GTI great terminal island 179~199
GU gyrus uncinate 229, 230
H H-field of Forel 233
h1 thalamic fasciculus 232~252, 418~422
h1-h2 h1 and h2 fasciculi 406
h2 lenticular fasciculus 220, 221-223, 226-229, 232-235, 238, 239, 240, 409, 419-422
HATA hippocampo amygdaloid transitional area 227, 229, 230, 233
Hb habenula 23
HBL lateral habenular nucleus 423, 424
HBM medial habenular nucleus 423, 424
hbx habenular commissure 424
HCd head of caudate nucleus 21, 23, 54, 55, 82, 83
HDB horizontal limb of the diagonal band 191, 193, 428, 429
hf hippocampal fissure 228~269, 268, 75~288, 292, 293
Hi hippocampus 22-27, 54-59, 79, 80, 195, 201, 207, 213, 219, 225, 231, 237, 243, 249, 255, 261, 267, 273, 279, 285, 291, 297~306, 406~412, 434
HiH hippocampal head 216, 217, 220, 222, 226, 228, 232
HPtg hamulus of the pterygoid bone 35, 49
Hy hypothalamus 24, 25, 54, 436
HyGl hyoglossus muscle 37-40, 45, 47, 49, 80
Hyoid hyoid bone 49, 51, 53, 79-81
I isthmus 97, 406
ial inferior alveolar artery, vein and nerve 35-38, 47
iala inferior alveolar artery 34, 49, 51, 76
ialv inferior alveolar vein 34
IAud internal auditory meatus 78, 79
IC inferior colliculus 275, 280, 281, 283, 287, 426
ic internal capsule 52, 54-57, 80-82, 192, 197~222, 410
ICCe iliocostalis cervicis muscle 40
ICG isthmus of cingulate gyrus 298~333
ICM inferior constrictor muscle of the pharynx 39, 40, 53, 80
icml incomplete medullary lamina of the globus pallidus 214-217, 220-223
ictd internal carotid artery 26-39, 51, 53, 55, 76-82
icv internal cerebral vein 59
IDPul inferior pulvinar nucleus, dorsal part 275, 277, 281, 283, 425, 426
IF interfascicular nucleus 253, 257, 259
IFG inferior frontal gyrus 17, 24, 25, 45-57, 73-79
IFG-asc inferior frontal gyrus, ascending part 96
IFG-ba inferior frontal gyrus, basilar part 96
IFGOp inferior frontal gyrus, opercular part 18-25, 49-59, 95, 96, 142~208, 404~414
IFGOr inferior frontal gyrus, orbital part 20-23, 95-97, 112~160, 406~413
IFGTr inferior frontal gyrus, triangular part 18-23, 95-97, 126~160, 405~413
ifo inferior fronto-occipital fasciculus 166~204
IFPG inferior frontopolar gyrus 95, 97, 102~118, 406~411
ifps inferior frontopolar sulcus 95, 97, 102~113
ifs inferior frontal sulcus 95, 96, 112~167
IG insular gyrus 148~172
IGP internal globus pallidus 54, 55, 209~241, 406~411
IGPul intergeniculate pulvinar nucleus 271, 424
IGr indusium griseum 149~247, 257, 277, 289, 293~301
ijugv internal jugular vein (sigmoid sinus/jugular bulb) 31, 33-40, 55, 57, 76-79
IL intralaminar thalamic nuclei and lamina 406, 409
ilab inferior labial artery and vein 39, 40
ilf inferior longitudinal fasciculus 178~378
ILG inferior lingual gyrus 328~340
ILgG inferior lingual gyrus 97, 406~411
ILG-l inferior lingual gyrus, lateral part 342~387
ILG-m inferior lingual gyrus, medial part 342~382
ilgs intralingual sulcus 95
ILPul inferior pulvinar nucleus, intermediate part 275, 277, 283, 287
ils intralingual sulcus 328~365
imfs intermediate frontal sulcus 136~149
iml internal medullary lamina of the thalamus 220~271, 418-424
impI anterior intermediate parietal sulcus of Jensen 96, 301~335
impII second intermediate parietal sulcus 96, 322~341
impIII third intermediate parietal sulcus 96, 342, 346, 348, 352, 354
INaC inferior nasal concha 33, 45
inav internal nasal vein 51
IncC incisive canal 37
Inf infundibular nucleus 407, 409, 429, 430
InfS infundibular stalk 53, 197, 199, 203, 205
InM intermediate hypothalamic nucleus (sexual dimorphic nucleus) 427, 429
Ins insula 20-25, 50-60, 76, 77, 153, 159, 165, 171~186, 192, 196~228, 231~292, 404~413
InTrM intertransversarii muscles 36, 37, 38
IO inferior olive 57, 82
IOb inferior oblique muscle (tendon) 30, 31, 45, 78, 81
IObCa inferior oblique capitis muscle 34, 57, 59, 61, 76-84
IOG inferior occipital gyrus 95-97, 342~399, 405-407, 410-413
iora infraorbital artery 31-33, 45, 47, 49, 79
IOrC infraorbital canal 45, 47
IOrF infraorbital foramen 79
IOrG intermediate orbital gyrus
iors intermediate orbital sulcus 97
ios inferior occipital sulcus 95-97, 354~385
IP interpeduncular nucleus 154, 156, 160, 251~265
IPAC interstitial nucleus of the posterior limb of the anterior commissure 215
ipcs inferior postcentral sulcus 96
ipets inferior petrosal sinus 29, 55, 77, 81
IPF interpeduncular fossa 24, 25, 55, 82, 241, 253
IPHT isthmo-parahippocampal transition area 405, 406, 410
IPL inferior parietal lobule 16-20
IPo insular pole 407, 412
ipocs inferior postcentral sulcus 232~239, 264~287
iprs inferior precentral sulcus 95, 96, 168~209
ips intraparietal sulcus 95, 96, 298~341
ips-a intraparietal sulcus, ascending segment 96
ips-d intraparietal sulcus, descending segment 96
ips-h intraparietal sulcus, horizontal segment 96, 300~313, 342~379
IPul inferior pulvinar nucleus 277, 283, 287, 406, 424, 425
IRec inferior rectus muscle 28-31, 45, 47, 49
irhs intrarhinal sulcus 168~199
IRoG inferior rostral gyrus 46-50
irs intrarhinal sulcus 217, 233
ISG inferior sagittal gyrus 97, 405, 406, 409, 410
isgs inferior sagittal sinus 55, 57, 97
ISM interspinalis muscle 36-40
iss inferior sagittal sulcus (S. limitans superior) 55, 57, 378~389
isst internal sagittal stratum 301, 305, 307
ita inferior temporal artery 24
ITG inferior temporal gyrus 22-27, 49-64, 73-79, 95-97, 156~375, 406~414
IThA interthalamic adhesion 223, 227
ithp inferior thalamic peduncle 211~239, 417-420
ITP inferior temporopolar region 147~177, 411
its inferior temporal sulcus 96, 97, 156~371
its-a inferior temporal sulcus, anterior segment 96
its-p inferior temporal sulcus, posterior ramus 96
IVF interventricular foramen 209, 211
IVPul inferior pulvinar nucleus, ventral part 275, 425
ivvpx internal vertebral venous plexus 35, 38, 57, 59, 79
JugP jugular process 78, 79
La lateral amygdaloid nucleus 193~227, 407, 408, 411
lab labial artery 79
lac lacrimal artery 47
Lac lacrimal gland 26, 27, 45
lacv lacrimal vein 29
LaDA lateral amygdaloid nucleus, dorsal anterior part 215, 217, 221
LaDL lateral amygdaloid nucleus, dorsal lateral part 211, 215, 217
LaDM lateral amygdaloid nucleus, dorsomedial part 215
LaI lateral amygdaloid nucleus, intermediate part 215, 221
LAngO levator anguli oris muscle 33-37, 78, 79
LaV lateral amygdaloid nucleus, ventral part 221
LC locus coeruleus 83
LD lateral dorsal thalamic nucleus 57, 82
lds lambdoid suture 25, 26, 27
LDTg laterodorsal tegmental nucleus 281, 283
lenf lenticular fasciculus 220~240, 419, 420
Lens lens 78, 79
LeVePal levator veli palatini muscle 32, 33, 51, 53, 80, 81
lf lateral (Sylvian) fissure 95, 96, 144~289
lf-a lateral fissure, anterior segment 96
lf-h lateral fissure, horizontal segment 95, 96, 97, 127~151
lf-m lateral fissure, middle segment 96
lfms lateral frontomarginal sulcus 95, 106-109, 112-114, 118, 120
lf-p lateral fissure, posterior segment 96
LFuG lateral fusiform gyrus 97
lf-v lateral fissure, vertical segment 96, 142~160
LG lateral geniculate nucleus 79, 253~271, 406, 410, 411, 422-424, 436
Lg lingual gland 39, 49
lga lingual artery 38-40, 47, 49, 51, 78-81
LgC longus capitis and colli muscles 78-81
LgCa longus capitis muscle 30-40, 53, 55
LgCo longus colli muscle 30, 35-40
LgFo lingual follicle 81
LgG lingual gyrus (O5) 80, 95, 97, 288~327, 407
lg-p lingual sulcus, posterior ramus 372, 373, 376-379
lgs lingual sulcus 97, 406
LgsCa longissimus capitis muscle 32-40, 57, 59, 61, 74-77
LgsCe longissimus cervicis muscle 36-40
LgsCeT longissimus cervicis muscle, tendon 37, 38
LgSpt lingual septum 45
lgv lingual vein 47, 49, 51
LH lateral hypothalamic area 197~233, 407, 409, 428-431
LHb lateral habenular nucleus 265, 269, 271
Li limen insulae 80, 82, 83, 178-181, 184-187, 191
LiCl limitans claustrum 197, 203~233
LIGl long insular gyrus I 405, 406
Lim limitans nucleus 265, 269, 271, 275, 406, 423-425
liml limiting medullary lamina of the globus pallidus 216, 217, 220-222, 226, 227
ll lateral lemniscus 270, 274, 275, 276, 280, 282, 286, 426
LLb levator labii superioris muscle 32, 33, 35, 78, 79
LLbAN levator labii superioris alaeque nasi muscle 33
LLPt lateral lamina of pterygoid process 49
lls lateral longitudinal stria 144~228, 234, 235, 240, 250, 262, 292-295, 298-300
LM lateral mammillary nucleus 221, 223, 227, 430, 431
lml lateral medullary lamina of the globus pallidus 178~253
lo lateral olfactory tract 178, 180, 184-187, 190-193, 196, 197, 199
lObCa inferior oblique capitis muscle 35
LOrG lateral orbital gyrus 97, 118~142, 406, 407, 411, 412
lors lateral orbital sulcus 96, 97, 108~143
los lateral occipital sulcus 96, 372~397
LOTG lateral occipitotemporal gyrus 26, 27
lots lateral occipitotemporal sulcus 95, 97, 156~226, 244~359
LPal levator palpebrae superioris muscle 26, 27, 45, 47, 49, 80
LPHT lingual-parahippocampal transition area 97
LPtg lateral pterygoid muscle 32, 33, 49, 51, 53, 76, 77, 79
LPtgL lateral pterygoid muscle, lateral belly 30, 31
LPtgM lateral pterygoid muscle, medial belly 30, 31
LPul lateral pulvinar nucleus 259~287, 406, 422-426
LRec lateral rectus muscle 28, 29, 45, 47, 49, 78
LReCa lateral rectus capitis muscle 32, 33, 55, 74
ls longitudinal stria 301
LSc levator scapulae muscle 36-40, 57, 59, 74, 75
LSD lateral septal nucleus, dorsal part 187~221
LSI lateral septal nucleus, intermediate part 187~221
LSV lateral septal nucleus, ventral part 175, 185, 187, 191, 193, 197, 199, 203
LT lamina terminalis 25, 84, 179, 181, 185, 187
LTh lateral thalamic nuclear region 80, 82
LTN lateral terminal nucleus of the accessory optic system 269, 423
LTu lateral tuberal nucleus 217, 221, 430
LuG lunate gyrus 96
lus lunate sulcus 95, 96, 405, 406
LV lateral ventricle 18~26, 53, 58, 59, 203~211, 229~287
Ly lymph node 37-40, 47, 55, 74-76
MaA mastoid antrum 57
Man mandible 32, 33, 35, 36, 37, 39, 49, 75-83
ManC mandibular canal 40, 45, 47, 49
ManF mandibular fossa 75
maprs marginal precentral sulcus 222, 226-229, 232-235, 238-240, 244
MasM masseter muscle 31-38, 45, 47, 49, 51, 73-75
MB mammillary body 25, 55
mcer middle cerebral artery 16~26, 46, 48, 52-58, 60, 62, 64, 77
MCM middle constrictor muscle of the pharynx 39, 40, 51, 53
mcp middle cerebellar peduncle 56, 57, 80
MD mediodorsal thalamic nucleus 56, 57, 82, 229~275, 405, 406, 409, 419-425
Md medulla oblongata 31
MDMC mediodorsal thalamic nucleus, magnocellular part 235~263, 418-423
MDPC mediodorsal thalamic nucleus, parvicellular part 239~257, 265
MDPL mediodorsal thalamic nucleus, paralamellar part 251~265, 422-425
Me medial amygdaloid nucleus 227, 229, 233, 235
ME median eminence 217
Me5 mesencephalic trigeminal nucleus 281, 283
MeA medial amygdaloid nucleus, anterior part 211, 215, 217
MentM mentalis muscle 40
mfb medial forebrain bundle 180~234, 417-422
MFG middle frontal gyrus 11-23, 45-60, 76-81, 95, 96, 106~225, 402-406, 411-413
mfms medial frontomarginal sulcus 95, 97, 102~118
MFPG middle frontopolar gyrus 95-97, 102~129, 405, 406, 409-411

mfps middle frontopolar sulcus 102, 103, 106-109, 112, 114
mfs midfusiform sulcus 97, 305
MFuG medial fusiform gyrus 97
MG medial geniculate nucleus 80, 263, 406, 410, 423, 424, 425
MGDP medial geniculate nucleus, dorsal posterior part 271
MGFi medial geniculate nucleus, fibrosus part 265, 269, 271
MGLi medial geniculate nucleus, limitans part 265, 269, 271
MGMC medial geniculate nucleus, magnocellular part 265, 269
MGPC medial geniculate nucleus, parvocellular part 265
MHb medial habenular nucleus 265, 269
MiTg microcellular tegmental nucleus 277
MiZyg minor zygomaticus muscle 32, 33, 34, 35
MjAC major alar cartilage 33, 34
MjZyg greater zygomaticus muscle 32-38, 45, 73-75
ml medial lemniscus 246~277, 423-425
ML medial mammillary nucleus, lateral part 223, 227, 430, 431
mlf middle longitudinal fasciculus 178~294, 424, 425
mlfc medial longitudinal fasciculus 264, 268, 270, 271, 274-277
MLPt medial lamina of pterygoid process 49
MLPul mediolateral pulvinar nucleus 275, 277, 281, 283, 287, 425, 426
mls medial longitudinal stria 144~241, 250, 262, 294, 298, 300, 304
MM medial mammillary nucleus, medial part 221~233, 407, 409, 430, 431
mm middle meningeal artery 28, 29, 53, 55
mmf middle meningeal artery, frontal branch 27, 51
mml medial medullary lamina of the globus pallidus 196~239, 241
mmp middle meningeal artery, parietal branch 55, 59
MNaC middle nasal concha 45
MnPO median preoptic nucleus 193
MnR median raphe nucleus 269, 271, 275
MOG middle occipital gyrus 95, 96, 370~388, 404-406, 411-413
molf medial olfactory radiation 173, 175
MOrG medial orbital gyrus 97, 108~159, 407-411
mors middle orbital sulcus 97, 112-115, 118-121, 124, 125
MOTG medial occipitotemporal gyrus 26, 27
mp mammillary peduncle 222, 226, 228, 419, 420
MPO medial preoptic nucleus 191, 193, 197, 199, 203, 205, 409, 428
MPOL medial preoptic nucleus, lateral part 197, 429
MPOM medial preoptic nucleus, medial part 191, 429
MPtg medial pterygoid muscle 32-38, 49, 51, 76-81
MPul medial pulvinar nucleus 271, 275, 277, 281, 283, 287, 406, 424-426
MRec medial rectus muscle 28, 29, 45, 47, 49, 80
MS medial septal nucleus 197, 199, 203, 205, 209, 211, 215, 217, 435
MScal middle scalenus muscle 35, 36
MSG middle sagittal gyrus 97, 376~393, 404, 405, 409, 410
MSG-p middle sagittal gyrus, posterior part 405, 406, 409, 410
Mst mastoid process of temporal bone 57, 73-75
MstC mastoid cells 73, 74
mt mammillothalamic tract 227-229, 232-234, 418-420
mtg mammillotegmental tract 226~241, 247, 253, 257, 259, 419-426
MTG middle temporal gyrus 19-27, 49-64, 73-79, 95-97, 156~375, 405-408, 412-414
mts middle temporal sulcus 202
Mul multifidus cervicis muscle 36-40, 59, 80
Mx maxilla 31, 33, 35-37, 78, 82, 84
mxa maxillary artery 30-33, 49, 51, 53, 76-80
MxS maxillary sinus 30, 31, 45, 47, 49, 78-81
mxv maxillary vein 53
MyHy mylohyoid muscle 37-40, 45, 47, 78-84
myhy mylohyoid nerve 39, 49, 51
Na nasal bone 29, 31
Nas nasalis muscle 30-35
nl nuchal ligament 31, 33, 35
nlac nasolacrimal duct 31
npal nasopalatine artery (sphenopalatine artery) 35, 84
NPhT nasopharyngeal tonsil 83
NSpt nasal septum 31, 45, 47
nuf nuchal fascia 29, 31, 33, 37
oaud pharyngeal opening of auditory tube 82
OB olfactory bulb 47
occ occipital artery, vein and (greater occipital) nerve 26-29
Occ occipital bone 25-27, 29, 31, 33, 82
occa occipital artery 25, 30-37, 53~67, 74, 76-78
occs occipital sinus 26, 59, 61, 63
occv occipital vein 25, 31, 34, 63, 65, 73, 74
OcFrF occipito-frontal muscle, frontal belly 45, 47, 73~82
OcFrO occipito-frontal muscle, occipital belly 65, 67, 73, 75, 76
OcG occipital gyrus (gyri) 15-25, 58, 60-68, 74-84, 288~375, 405, 406, 409-411
ocm occipito-mastoid suture 29
OcP occipital pole 96, 97
OFat orbital fat body 45, 47
OFG orbitofrontal gyri 45-51, 76-84
OFOp orbitofrontal operculum 405, 406
ofr orbitofrontal fibers 144~196
olf olfactory tract 26, 49, 51, 169, 172, 173
OlfA olfactory area 156~180, 407, 409, 410
olfr olfactory radiation 168, 172, 173
olfs olfactory sulcus 97, 112~169
OLV occipital horn of lateral ventricle 21, 23, 62-65, 79
OmHy omohyoid muscle 40, 49, 51
OO orbicularis oculi muscle 26-33, 45, 73-80
OOr orbicularis oris muscle 36-40, 77-80, 82
opha ophthalmic artery 45, 47, 49, 80, 81
ophv ophthalmic vein 49
ops occipitopolar sulcus (extreme fissure of Seitz) 95, 97, 388-391, 394, 395
opt optic tract 24, 25, 52, 54, 55-57, 80, 197~252, 407~411, 417-421
or optic radiation 23, 79, 252~271, 298~372, 423-425
Oral oral cavity 78, 80, 82
OrG orbital gyrus/gyri 24-27, 96
ors orbital sulcus 169
Otic otic ganglion 53
ox optic chiasma 26, 52, 53, 84, 178~199, 407, 409, 428
P3V preoptic recess of the third ventricle 84, 179~193
Pa paraventricular hypothalamic nucleus 407, 409
PaAP paraventricular hypothalamic nucleus, anterior parvocellular part 191, 193, 428
PAC periamygdaloid cortex 179~224
PACl preamygdalar claustrum 185~215
pacs paracentral sulcus 95-97, 192~239
PaD paraventricular hypothalamic nucleus, dorsal part 197, 199, 203, 205, 209, 211
PaFo paraventricular hypothalamic nucleus, fornical part 203, 205
PAG periaqueductal gray 269, 271, 275, 277, 281, 283, 287
Pal palatine bone
PalG palatine gland(s) 35, 36, 45, 47
PalGl palatoglossus muscle 37
palhy pallidohypothalamic fibers 220, 221, 417, 418
PalHy pallidohypothalamic nucleus 221, 223, 227
paln palatine nerve (s) 47
PalPh palatopharyngeus muscle 38, 51, 80
PalT palatine tonsil 51, 80
PAM periamygdaloid cortex 27, 80, 191-194, 196, 198, 202, 203, 205, 407
PaMC paraventricular hypothalamic nucleus, magnocellular part 197, 199, 203, 205, 209, 211, 429
PAnG posterior angular gyrus 95, 96, 330~382, 402-405, 411-413
PaO paraoptic nucleus 215
pap optic papilla 45
PaPC paraventricular hypothalamic nucleus, parvocellular part 203, 205, 209, 211, 428-430
PaPo paraventricular hypothalamic nucleus, posterior part 211, 215, 217, 221, 417, 430
papx parotid plexus 31
Par parietal bone 25, 26
PaS parasubiculum 234~278
PAT posterior arch of atlas 82
pau posterior auricular artery and vein 34, 35
PAu posterior auricular muscle 28
paua posterior auricular artery 53, 55, 57
pauv posterior auricular vein 26-29, 57, 59
PBG parabigeminal nucleus 287
PBP parabrachial pigmented nucleus 247~259, 265
pc posterior commissure 97, 264~271, 406, 409, 424-426
PCA precommissural archicortex 97, 172~181, 407, 409
PCC posterior cingulate cortex (B.Vogt) 97
PCe paracentral thalamic nucleus 421, 422
pcer posterior cerebral artery 18~26, 54-60, 62, 64, 66
pcf paracentral fossa 97, 250~281
pcfx precommissural fornix 178-181, 184, 185, 187, 190-192
PCG precallosal gyrus 97, 142~159
pcgs paracingulate sulcus 97, 142
PCI postcentral insular cortex 222~244
pcis posterior central insular sulcus 190~246
PCL paracentral lobule 14, 16, 17, 59-65, 97, 208~310, 402-404, 409, 410
PCo posterior cortical amygdaloid nucleus 217, 221, 223, 227, 229, 230, 407, 435
pcoma posterior communicating artery 26
pcr posterior corona radiata 244~282
pcs postcentral sulcus 95-97, 240~263, 286
PCun precuneus 16, 20-23, 62-68, 80-84, 97, 286~370, 402-405, 409-411
Pe periventricular nucleus 209, 211, 215, 217, 409
PedL peduncle of lentiform nucleus 223, 227, 229, 233, 411
PeF perifornical nucleus 211, 215, 217, 429, 430
PeP perpendicular plate 45
PeV periventricular nucleus 421, 422, 423
PF parafascicular thalamic nucleus 245~263, 420-423
PH posterior hypothalamic area 221~233, 407, 409, 430, 431
PHA parahippocampal-amygdaloid transition area 204, 208-211, 214-217
phar pharyngeal branches 51, 53
PHG parahippocampal gyrus 23-25, 78-80, 95, 97, 210~316, 406, 407, 409-412
PhRe pharyngeal recess 53
Pi pineal gland 23, 58, 59, 271, 275, 277, 281, 283
pi preoccipital notch 96, 97
pic posterior limb of the internal capsule 23, 228~276
pica posterior inferior cerebellar artery 26, 57, 61
PIR parainsular region 178, 180, 184, 186
Pir piriform cortex 52, 53, 80, 169~189, 201, 207, 407, 410-412
PirF piriform cortex, frontal part 168~206, 407
PirR piriform recess 51
PirT piriform cortex, temporal part 174~209, 407
Pit pituitary gland 27, 53, 84
Plat platysma 37-40, 45, 47, 49, 73, 75-78, 80, 82
pm principal mammillary fasciculus 223
pMCC posterior midcingulate cortex (B.Vogt) 97
PMOL posteromedial orbital lobule 97, 160, 162, 165, 166, 168, 407, 408, 410
PN paranigral nucleus 245, 263, 265
pna posterior nasal artery 49
POc parieto-occipital arc (first parieto-occipital « plis de passage » of Gratiolet) 96
POc-a parieto-occipital arc, anterior part 95-97, 403, 342~370, 409-411
PoCi pontine cistern 27, 29, 55
POc-p parieto-occipital arc, posterior part 95-97, 372~388, 403-405, 409, 410
pof parietooccipital fissure 96, 97, 348~385
PoG postcentral gyrus 11-23, 55-66, 73-84, 95-97, 220~309, 402~414
polfs preolfactory transverse sulcus 95, 97
Pons pons 27, 29, 55-57, 82, 84, 235~263
pons pontine fibers 238, 240, 252
POp parietal operculum 20, 21, 60, 61, 74-77, 96, 238~298, 404, 405, 412-414
POrG posterior orbital gyrus 97, 130~166, 406, 407, 410, 411
pors posterior orbital sulcus 97, 136~168
pors-m posterior orbital sulcus, middle branch 97, 144~160
pos praeolfactory sulcus 108, 109, 112, 113
posc postreme subcallosal sulcus 97
PP peripeduncular nucleus 259, 269
PPA peripeduncular area 259, 263, 265, 269, 422, 423
ppa posterior parietal sulcus (Vogt) 95, 96, 97
PPCl prepiriform claustrum 161~191
ppms posterior paramidline sulcus 96, 276~335
PPo planum polare 55, 56, 148~249, 406-408, 412-414
PPo-l planum polare, lateral part 184~225
pps posterior parolfactory sulcus 97, 168~180
PRC perirhinal cortex 95, 97, 168~256, 407, 408, 411, 412
PRC35 perirhinal cortex, BA 35 158~255
PRC36 perirhinal cortex, BA 36 169~255
PrCuF precuneiform area
prculs precuneal limiting sulcus 331~343, 360~379
prcus precuneal sulcus 330, 334, 336, 340, 342
PRF prerubral field 420
prf principal mammillary fasciculus 227, 228, 233, 235, 418, 419
PrG precentral gyrus 11-23, 54-64, 74-84, 95-97, 168~279, 402-406, 409-414, 422
prop preopercular sulcus 95
prs precentral sulcus 95, 96
PrS presubiculum 224~293
PRt prereticular zone 191~221, 417, 418
prts pretriangular sulcus 95, 96, 112-115, 118, 119
ps polar sulcus 150~175
psa posterior superior alveolar artery 32, 33, 45, 47, 79
psan posterior superior alveolar nerve 33
PSCe posterior subcentral gyrus 96
pscs posterior subcentral sulcus 228, 232, 234
PSR perisplenial region(B.Vogt) 97
PSt parastriate area 95, 406, 410
PStr parastriate area 318, 321, 322, 324, 327, 328, 330, 333
PT paratenial thalamic nucleus 215~251, 257, 417-423
PTc pretectal area 265, 269, 271, 275, 424, 425
ptcos posterior transverse collateral sulcus 95, 97
ptcs posterior transverse collateral sulcus 342~367
Ptd parotid gland 31-33, 35-38, 53, 55, 73-77
ptdd parotid duct 35, 36, 47, 49, 51, 73, 75, 76
PTe planum temporale 20-25, 50-61, 73-77, 228~298, 405, 411, 413, 414
PTG paraterminal gyrus 52, 53, 97, 168, 171~180, 407
PTg pedunculopontine nucleus 269, 271, 277
Ptg pterygoid process 32, 33
PtgC pterygoid canal 51
PtgPal pterygopalatine ganglion 30, 31, 49
ptgpx pterygoid plexus 31, 51, 75, 76, 78, 79
PtPF pterygopalatine fossa 49, 80, 81
ptpt parieto-temporopontine tract 240, 244, 246, 250
ptr posterior thalamic radiation 298, 300, 304
pts paraterminal sulcus 97
Pu putamen 23, 52-57, 78-80, 151~277, 405-407, 411, 436
Pul pulvinar thalami 23, 58, 59, 79, 80, 82, 405, 409-411
PuLi limitans putamen 235
PuV ventral putamen 217~251
PV paraventricular thalamic nucleus 215~259, 418-423
pvf prevertebral fascia 33
py pyramidal tract 57, 84, 240, 244, 246, 250
QP quadrigeminal plate 59
R red nucleus 24, 56, 57, 82-84, 245, 406, 407, 409, 438
racc radiation of corpus callosum 138~240, 301, 305, 307
rapx retroarticular (venous) plexus 30, 31
ras radiate sulcus (Eberstaller) 95, 96, 120~132
rcc rostrum of corpus callosum 51, 97, 154, 156, 160, 162, 166
rcs-i retrocalcarine sulcus, inferior (lower) branch 95, 97, 372~383, 409
rcs-s retrocalcarine sulcus, superior (upper) branch 95, 97, 384~395, 406, 409
Re reuniens thalamic nucleus 223~257, 418-422
RePMi rectus capitis posterior minor muscle 30-33, 61, 63, 80, 81
RePMj rectus capitis posterior major muscle 32-35, 61, 63, 76-81
rhs rhinal sulcus 97, 166~253
RisM risorius muscle 38, 39
RLi rostral linear nucleus 245, 253, 257, 259
rmv retromandibular vein 34-36, 38, 51, 53, 73-77
rmx retromammillary commissure 232, 233, 234, 235, 238, 239
RoG rostral gyrus 97, 118~154, 406~410
ros rostral sulcus 97, 124~151
ros-i rostral sulcus, inferior (lower) branch 97, 108~121
ros-s rostral sulcus, superior (upper) branch 97
RPC red nucleus, parvocellular part 247, 251, 253, 257, 259, 263
RSC retrosplenial cortex 277~307
rsc-i retrocalcarine sulcus, inferior branch 407
RSG retrosplenial limbic gyri (von Economo) 97
RSp retrospenial cortex 410
Rt reticular thalamic nucleus 56-59, 215~287, 405, 406, 417~426
S/MCM superior and middle constrictor muscle 37, 38, 39
S subiculum 24, 25, 54-59, 221~307, 406, 407, 408, 411
SalPh salpingopharyngeus muscle 33
SArS subarachnoid space 35
sas semiannular sulcus 204~232
SB striatal cell bridge(s) 54~58, 80, 155, 157, 167, 187, 221, 227, 235, 239, 247, 253
sbps subparietal sulcus 97, 292~367
SC superior colliculus 271~287, 425, 426
SCA subcallosal area 52, 84, 97, 156~181, 406, 407, 409
sca superior cerebellar artery 24, 26, 29, 55, 57, 59
scal subcallosal fasciculus 155~169, 187~193, 197, 271, 275
ScalM scalenus muscle 36-40, 55, 57, 59, 77
SCC semicircular canals 57
scc splenium of the corpus callosum 21, 59, 60, 97, 270~310
SCD semicircular ducts 76
SCG subcallosal gyrus 149, 166
SCGn superior cervical ganglion 36, 37, 38
SCGP supracapsular part of the globus pallidus 179~209, 217
SCh suprachiasmatic nucleus 185~205, 428, 429
SChC suprachiasmatic nucleus, compact division 427, 428
SChD suprachiasmatic nucleus, dorsal division 427, 428
SCM superior constrictor muscle of the pharynx 32-37, 78, 79
SCMPP superior constrictor muscle, pterygopharyngeal part 80
scp superior cerebellar peduncle 58, 246~263, 270~283, 426
scr superior corona radiata 150~226
scs subcalcarine sulcus 97, 262, 409
SCS subcallosal stratum 143~167, 173~203, 211, 229, 233, 241~265, 275
SCTI subcaudate terminal island 185
SeC septal nasal cartilage 33, 35
SEpS subependymal stratum 211, 215, 229, 235, 239
SFG superior frontal gyrus 11-23, 45-61, 78-84, 95, 96, 106, 108, 111, 402, 409-412
SFGL superior frontal gyrus, lateral part 112~244, 402-405
SFGM superior frontal gyrus, medial part 97, 112~225, 402-405, 409
SFi septofimbrial nucleus 185, 187, 191, 193
sfms superficial medullary stratum 259, 263, 271, 275
SFO subfornical organ 203, 205, 209, 211, 217
sfo superior fronto-occipital fasciculus 136~268, 274~294
SFPG superior frontopolar gyrus 95-7, 102~124, 404-406, 409-411
sfps superior frontopolar sulcus 95, 97, 106-109, 112-115, 118-121
SFPul superficial pulvinar nucleus 269~287
sfs superior frontal sulcus 95, 96, 108~223
SG straight gyrus 26, 27, 45-52, 82, 83, 95, 97, 112~171, 407, 408, 409
SGe suprageniculate nucleus 257, 271, 275, 424
SGl substantia gliosa (subependymal gray) 143~169, 197, 205, 209, 211
sgr radiation of straight gyrus 118~166
sH Heschl sulcus 228~270

shl stylohyoid ligament 49, 51
SHThC superior horn of thyroid cartilage 39, 40
sigs sigmoid sinus 26-31, 57, 59, 61, 75
SL sublingual gland (and duct) 39, 40, 45, 47, 80, 81
sld sublingual duct 80
slf I superior longitudinal fasciculus I, dorsal component 114~378
slf II superior longitudinal fasciculus II, central component 114~370
slf III superior longitudinal fasciculus III, ventral component 114~370
slf superior longitudinal fasciculus 420, 421, 422
SLG superior lingual gyrus 52, 53, 226, 228, 232, 328~369
slga sublingual artery 45
SLgG superior lingual gyrus 97, 405-407, 409-411
slgv sublingual vein 45
slic sublenticular part of the internal capsule 216~288
sln superior laryngeal nerve 37, 38, 39, 40
sls sublenticular stria 192, 196, 198, 202, 204, 208, 210
sm stria medullaris of thalamus 23, 210~265, 417-424
SM submandibular gland 37-40, 49, 51, 75, 76, 78
sma submental artery 45, 47
smd submandibular duct 39, 40, 45, 47, 49, 82
SMG supramarginal gyrus 15-21, 60-65, 73-75, 95, 96, 228~327, 402-405, 411-414
smv submental vein 51, 53
SMV superior medullary velum 58
SN substantia nigra 24, 25, 56, 57, 82-84, 269, 409, 438
SNC substantia nigra, pars compacta 233~265, 407, 410
SNR substantia nigra, pars reticulata 229~265, 407, 410
SO supraoptic nucleus 191~205, 407, 409, 428, 429
SOb superior oblique muscle 27, 45, 47, 49
SObCa superior oblique capitis muscle 32, 33, 57, 59, 61, 76, 77
socv suboccipital venous plexus 78, 79
SODL supraoptic nucleus, dorsolateral part 209, 211, 215, 429, 430
sof superior occipitofrontal fasciculus 21, 155
SOG superior occipital gyrus 95-97, 394, 399, 404-406, 410-412
SOG-l superior occipital gyrus, lat part 382, 384, 387, 388, 390, 393
SOG-m superior occipital gyrus, medial part 376~393
sophv superior ophthalmic vein 26, 27, 29
sora supraorbital artery 45
sors supraorbital sulcus 97
sos superior occipital sulcus 95, 96, 102~119, 126, 127, 382, 383
SOVM supraoptic nucleus, ventromedial part 209, 211, 215, 429, 430
sox supraoptic commissure 196~215, 220, 221, 417-419
SPal soft palate 49, 51, 83, 84
SPalF salpingopalatinal fold 83
spas superior parietal sulcus 95, 96, 322~343
SpAx spinous process of axis 35, 36, 61
spcs superior postcentral sulcus 96, 289~307
spets superior petrosal sinus 55, 57
SPF subparafascicular thalamic nucleus 245~257, 420-422
Sph sphenoid bone 26, 27, 29, 31
SPhF salpingopharyngeal fold 82
SphGW sphenoid, greater wing 75, 76, 77
sphml sphenomandibular ligament 51
sphpal sphenopalatine artery 30, 31
sphps sphenoparietal sinus 26, 27, 28, 29
SphS sphenoid sinus 28, 29, 49, 51, 53, 84
sphzg sphenozygomatic suture 27
Spinal spinal cord 35
SPL superior parietal lobule 11-19, 63-68, 76-79, 95-97, 280~370, 402-404, 409-413
SplCa splenius capitis muscle 28-40, 59, 61, 63, 65, 73-79, 81
SplCe splenius cervicis muscle 36-40, 77
SplM splenius capitis and cervicis muscle 40
SpM spinalis muscle 37-40
spocs superior postcentral sulcus 288~306
sprs superior precentral sulcus 95, 96, 174~235
spth spinothalamic tract 270, 271, 274, 276, 280
SptP septum pellucidum 53, 173
SPul superior pulvinar nucleus 269, 271, 275, 277, 424, 425
SRec superior rectus muscle 26, 27, 47, 49, 78-80
SRoG superior rostral gyrus 45, 46-51
ss straight sinus 61, 63
ssa sulcus semiannularis
SSG superior sagittal gyrus 404-406, 409, 410
SSG-a superior sagittal gyrus, anterior part 95
SSG-p superior sagittal gyrus, posterior part 95
ssgs superior sagittal sinus 47, 51, 57~71, 95, 97, 376~391
SSpCa semispinalis capitis muscle 26-40, 59, 61, 63, 65, 76-79, 81
SSpCe semispinal cervicis muscle 37-40, 61, 79
SSpG subsplenial gyrus 299, 300, 303, 304
sss superior sagittal sulcus (v.Economo/Koskinas) 95, 97, 376~391
SSTI substriatal terminal island 169~209, 217
sstr sagittal stratum 304~378
st stria terminalis 21, 23, 56, 59, 79, 80, 82, 186~287, 417-426
sta superficial temporal artery 25-33, 73
staf superior temporal artery, frontal branch 49, 51
stam superior temporal artery, middle branch 53
stap superior temporal artery, posterior branch 53
STG superior temporal gyrus 17-25, 49-65, 73-77, 79, 95, 96, 156~358, 403-407, 412-414
STh subthalamic nucleus 56, 57, 233~251, 406, 407, 409, 419, 420, 421, 438
StHy sternohyoid muscle 47, 49, 79-81
sthy superior thyroid artery 39, 40, 51, 53
sthyv superior thyroid vein 51
StM sternomastoid muscle 31-35, 37-40, 53~63, 73-75
str superior thalamic stria 208~244
sts superior temporal sulcus 95, 96, 151~307, 354~371
sts-a superior temporal sulcus, anterior segment 96
sts-asc superior temporal sulcus, ascending segment 96, 306~337, 340, 341
sts-h superior temporal sulcus, horizontal segment 96, 306~365
sts-p superior temporal sulcus, posterior segment 96
StT sternomastoid muscle, tendon 30, 74
stv superficial temporal vein 25, 29, 55, 57
Sty styloid process 30-34, 53
StyGl styloglossus muscle 35-38, 49, 51, 53, 77, 78
StyHy stylohyoid muscle 35, 36-40, 51, 53, 77-79
StyPh stylopharyngeus muscle 33, 35-38, 53, 77, 78
SuM supramammillary nucleus 221, 223, 227, 430, 431
sumx supramammillary commissure 233, 235, 239, 420
sutra supratrochlear artery 26, 27
sutrn supratrochlear nerve 27
sutrv supratrochlear vein 26
sv septal vein 145, 163~211
SxD sexual dimorphic nucleus 197, 199
Symp sympathetic trunk 37-40, 76
sz stratum zonale 232~244
TCb tentorium cerebelli 57, 59, 65
TCd tail of caudate nucleus 21, 23, 55-59, 79, 229~289, 406, 407, 411
TCl temporal claustrum 181~211
tclv tela choroidea of the lateral ventricle 247
Tec tectum of midbrain 58, 82-84
Temp temporal bone 25-27, 31, 55
TempM temporalis muscle 25-34, 47~61, 73-78
TempP temporal bone, petrosal part 29
TempT temporalis muscle, tendon 35, 73-75
TenT tensor tympani muscle 55
TeVePal tensor veli palatini muscle 32-34, 49, 51, 78, 80, 81
TF parahippocampal area TF 253~297
tf temporal fascia 25, 29, 31
tfa transverse facial artery 32, 33, 45, 47, 49, 51, 53
tfi tenia of fimbria 239, 247, 253
tfp transverse fibers of the pons 245
tfv transverse facial vein 53
tfx tenia of fornix 217, 239, 253, 277
TH parahippocampal area TH 257~281
Th thalamus 20-23, 81, 83, 84, 436
ThC thyroid cartilage 40, 49, 80, 81
ThHy thyrohyoid muscle 39, 40, 49, 51, 80
ThHyMe thyrohyoid membrane 39, 40
thr thalamic radiation (corona radiata) 79
TIG transverse insular gyrus 97, 142~162, 407, 411, 412
TL temporal lobe 28, 29, 51, 55
tla transverse ligament of atlas 83
TLev torus levatorius 82
TLV temporal horn of lateral ventricle 27, 54-59, 80, 217~287
TM tuberomammillary nucleus 215, 217, 221, 223, 407, 430, 431
TMD temporomandibular disc 53
tongue tongue 37, 47, 79, 81
TOp temporal operculum 74-77, 96
tors transverse orbital sulcus 97, 126, 127, 130-133, 136
tos transverse occipital sulcus 95, 96, 382-385
tos-l transverse occipital sulcus, lateral ramus 95, 96, 384, 388, 389
tos-m transverse occipital sulcus, medial ramus 95, 96, 384, 388, 389
TOTZ temporo-occipital transition zone 95, 96, 346~375, 404, 405, 412, 413
tp tapetum 216~372
TP temporal pole 26, 27, 49, 50, 51, 96, 407, 408, 410-412
TPC temporopolar cortex 150, 153, 154
TPCl lateral temporopolar cortex 149~177
TPCm medial temporopolar cortex 147~167
TPG temporopolar gyrus 95, 97, 156~172, 407, 408, 411-413
TrA triangular area (Wernicke) 265, 269
TrLV trigone of lateral ventricle 60, 61, 78, 79, 289~307
TrP4 transverse process of fourth vertebra 40
TrPAt transverse process of the atlas 34, 35, 77, 79
trs transverse sinus 63, 65, 74-76, 78, 79
TS triangular septal nucleus 191, 193, 197, 199
ts triangular sulcus 96
tsc tenia semicircularis 217, 239, 247, 253, 277
tsv thalamostriate vein 21, 58, 191~241, 247, 251, 257, 263, 283, 287
tt tenia of thalamus 217, 227, 239, 253
TTG transverse temporal gyrus/gyri 20-23, 54-61, 73-77, 405, 406
TTG1 anterior transverse temporal gyrus 210~292, 405, 412-414
TTG2 posterior transverse temporal gyrus 252~292, 404, 405
tth dorsal trigeminothalamic tract 265
TTub torus tubarius 82
Tu olfactory tubercle 52, 53, 175~205
TuTI tubercular terminal islands 179~199
tv temporal vein(s) 26, 27, 29
tvt transverse temporal sulcus 96
TyC tympanic cavity 29, 77
TzM trapezius muscle 31-40, 65, 67, 76-81
Un uncus 53, 54, 95, 97, 178~251, 407, 429
unc uncinate fasciculus 120~232
Unn uncinate nucleus 197, 199, 427, 429
unn uncal notch 193~215, 220~232
uns uncal sulcus (impression) 184, 190~216
us uncal sulcus 95, 97, 221, 241, 245, 247
Uv uvula 33, 35, 36, 37, 49, 51
v vein 37-40
VA ventroanterior thalamic nucleus (ventral anterior nucleus) 217, 221, 223, 229, 409, 417, 418
VAb basal ventroanterior thalamic nucleus [VM] (entry zone of nigral and amygdaloid afferents) 233~241, 406, 409, 419, 420
vaf ventral amygdalofugal fibers (pathway) 196~216, 417-419
VAL lateral ventroanterior thalamic nucleus 227, 233~239, 405, 406, 410, 418-420, 435
VAM medial ventroanterior thalamic nucleus 227, 233, 405, 406, 410, 418, 419, 435
VAMC ventroanterior thalamic nucleus, magnocellular part 227, 229, 233, 235, 418, 419
VCl ventral claustrum 175~245
VDB vertical limb of the diagonal nucleus 185, 187, 191
Ver vermis of cerebellum 23, 58, 60
vert vertebral artery 30-38, 40, 55, 57, 59, 78-81
Vert5 fifth cervical vertebra 39, 40, 55
Vert6 sixth cervical vertebra 40
VGP ventral globus pallidus 187~245
VL ventrolateral thalamic nucleus 56, 57, 229, 405, 406, 410, 435
VLA anterior ventrolateral thalamic nucleus 223, 233, 235, 239, 406, 419, 420
VLb basal (inferior) ventrolateral thalamic nucleus [VPI] (entry zone of the cerebellar fibers) 241~247, 410, 420, 421
VLP posterior ventrolateral thalamic nucleus 406, 435
VLPE posterior ventrolateral thalamic nucleus, external part 235~253, 419-421
VLPI posterior ventrolateral thalamic nucleus, internal part 241~247, 420, 421
VMH ventromedial hypothalamic nucleus 407, 409, 429, 430
VMHDM ventromedial hypothalamic nucleus, dorsomedial part 209~221, 429, 430
VMHVL ventromedial hypothalamic nucleus, ventrolateral part 209~221, 429, 430
Vom vomer 31, 33, 34, 45, 49
VP ventroposterior thalamic nucleus 193~205, 221~245
VPb basal ventroposterior nucleus [VMpo] (entry zone of sensory afferents) 251~269, 406, 422-424
VPL lateral ventroposterior thalamic nucleus 247~265, 405, 406, 410, 421-424
VPM medial ventroposterior thalamic nucleus 251~259, 406, 421, 422
VPMPC medial ventroposterior thalamic nucleus, parvicellular part 245~259, 420-422
vr2 ventral ramus 2 57
vr4 ventral ramus 4 57
vt velum terminale 235
VTA ventral tegmental area 235~245, 251~259
vtx ventral tegmental decussation 256, 258
xscp decussation of the superior cerebellar peduncles 262~275, 423-425
ZI zona incerta 215~239, 245~259, 406, 418-422, 435
ZID zona incerta, dorsal part 241
ZIV zona incerta, ventral part 241
Zyg zygomatic bone 29, 31, 33, 45, 75
ZygA zygomatic arch 47, 49, 51, 73
ZygM zygomatic muscle(s) 76, 77

ATLAS OF THE HUMAN BRAIN

4TH EDITION

JÜRGEN K. MAI
MILAN MAJTANIK
GEORGE PAXINOS

The fourth edition of *Atlas of the Human Brain* presents the anatomy of the brain at macroscopic and microscopic levels, featuring different aspects of brain morphology and topography. This greatly enlarged new edition provides the most detailed and accurate delineations of brain structure available. It includes features which assist in the new fields of neuroscience – functional imaging, resting state imaging and tractography. Atlas of the Human Brain is an essential guide to those working with human brain imaging or attempting to relate their observations on experimental animals to humans. Totally new in this edition is the inclusion of Nissl plates with delineation of cortical areas (Brodmann's areas), the first time that these areas have been presented in serial histological sections.

Part 1: *The Atlases of the Brain in the Head* (Macroscopic Atlas) displays the brain in the head sectioned in the three cardinal planes. It consists of serial 1 cm thick sections from three human heads that were previously scanned with MRI. This presentation allows for correlation of the brain with bony landmarks, nerves, and blood vessels. In addition, included are X-ray images of the cadaver sections and MR-images from a healthy volunteer showing levels corresponding to those depicted in the atlas plates.

Part 2: *The Atlas of the Brain in MNI Stereotaxic Space* (Microscopic Atlas) consists of a detailed atlas of the isolated brain in MNI stereotaxic coordinates represented by 149 serial histological sections of one hemisphere with meticulous delineations. It displays the myelo- and cytoarchitecture accompanied by detailed diagrammatic delineations.

New Features of the 4th edition:

- The contents of the Atlas of the brain in MNI stereotaxic space has been extensively expanded from 143 pages, showing 69 levels through the hemisphere, to 314 pages representing 99 levels.
- In addition to the fiber-stained (myelin) plates, we now provide fifty new (Nissl) plates covering cytoarchitecture. These are interdigitated within the existing myelin plates of the stereotaxic atlas.
- All photographic plates now represent the complete hemisphere.
- All photographs of the cell- and fiber-stained sections have been transformed to fit the MNI-space.
- Major fiber tracts are identified in the fiber-stained sections.
- In the Nissl plates cortical delineations (Brodmann's areas) are provided for the first time.
- The number of diagrams increased to 99. They were now generated from the 3D reconstruction of the hemisphere registered to the MNI- stereotaxic space. They can be used for immediate comparison between our atlas and experimental and clinical imaging results.
- Parts of cortical areas are displayed at high magnification on the facing page of full page Nissl sections. Images selected highlight those areas which are thought to correspond with those published by von Economo and Koskinas (1925).
- A novel way of depicting cortical areal pattern is used: The cortical cytoarchitectonic ribbon is unfolded and presented linearly. This linear representation of the cortex enables the comparison of different interpretations of cortecal areas and allows mapping of activation sites.
- Low magnification diagrams in the horizontal (axial) and sagittal planes are included, calculated from the 3D model of the atlas brain.

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